This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

Transactions of the Asiatic Society of Japan

Asiatic Society of Japan

Digitized by Google

S-IA-Y

HARVARD UNIVERSITY.

LIBRARY

OF THE

MUSEUM OF COMPARATIVE ZOÖLOGY.

6960.

Exchange.

July 20, 1875 - April 21, 1879.

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

TRANSACTIONS

OF

THE ASIATIC SOCIETY

OF JAPAN.

VOL. VI.

(From 27th October, 1877, to 22nd June, 1878.)

YOKOHAMA:

1878.

Digitized by Google

Digitized by Google

CONTENTS.

PAGE.

Review of the Introduction of Christianity into China and Japan. By John H. Gubbins, Esq., H.B.M.'s Consular Service, Japan 1

An Analysis of Certain Articles of Japanese Food. By B. W. Dwars, Esq. 63

The Introduction of Tobacco into Japan. By Ernest M. Satow, Esq., H.B.M.'s Legation 68

The Water Supply of Tôkiyô. By R. W. Atkinson, B. Sc. 87

The Maiden of Unahi. By Basil Hall Chamberlain, Esq. 106

The Castle of Yedo. By Thomas R. H. McClatchie, Esq., H.B. M.'s Consular Service, Japan 119

Kak'kê. By William Anderson, Esq., F. R. C. S., England 155

Remarks on the Dojô. By Dr. H. Faulds 183

The Korean Potters in Satsuma. By E. M. Satow, Esq., H.B.M.'s Legation 193

Biological Notes. By H. Faulds, L. F. P. & S. 205

The Use of the Fire-drill in Japan. By E.M. Satow, Esq., H.B.M.'s Legation 223

Hideyoshi's Invasion of Korea. By W. G. Aston, Esq., H.B.M.'s Legation 227

Destructive Earthquakes in Japan. By I. Hattori, Esq. 249

Notes on the Manufacture of Oshiroi (Whitelead). By R. W. Atkinson, B. Sc. 277

Some Remarks on Constructions in Brick and Wood, and their Relative Suitability for Japan. By George Cawley, Esq. 291

Notes on some of the Volcanic Mountains in Japan. By D. H. Marshall, Esq., M. A. 321

Notes on the Amount of Sulphuretted Hydrogen in the Hot Springs of Kusatsu. By Edward Divers, M.D., F.C.S. 346

Analysis of the Sweet Potato. By B. W. Dwars, Esq. 349

An Examination of the Earthquakes Recorded at the Meteorological Observatory, Tôkiyô. By W. S. Chaplin, Esq. 352

On the Mediæval Colloquial Dialect of the Comedies. By B. H. Chamberlain, Esq. 357

Some Scenes between the Ancient and the Modern Capitals of Japan. By W. G. Dixon Esq. 401

Notes of a Visit to Hachijô in 1878. By F. V. Dickins and E. M. Satow 435

Appendix I. Extract from Captain Beechey's Narrative, The Bonin Islands 478

Appendix II. Extract from the *Nichi Nichi Shimbun* Account of Hachijô 486

The Climate of Japan. By Dr. J. J. Rein 491

Catalogue of Books in the Society's Library 585

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

TRANSACTIONS

OF

THE ASIATIC SOCIETY

OF JAPAN.

VOL. VI.—PART I.

From 27th October, 1877,

TO

26th January, 1878.

YOKOHAMA.

1878.

PRINTED AT THE "JAPAN MAIL" OFFICE.

Digitized by Google

Digitized by Google

CONTENTS.

	Page.
Review of the Introduction of Christianity into China and Japan, by John H. Gubbins, Esq., H. B. M.'s Consular Service, Japan	1 to 62
An Analysis of Certain Articles of Japanese Food, by B. W. Dwars, Esq	63 „ 67
The Introduction of Tobacco into Japan, by Ernest M. Satow, Esq., H. B. M.'s Legation	68 „ 86
The Water Supply of Tôkiô, by R. W. Atkinson, B. Sc.	87 „ 105
The Maiden of Unahi, by Basil Hall Chamberlain, Esq	106 „ 117
The Castle of Yedo, by Thomas R. H. McClatchie, Esq., H. B. M.'s Consular Service, Japan	119 „ 154
Kak'ké, by William Anderson, Esq., F. R. C. S., England	155 „ 181
Remarks on the Dojô, by Dr. H. Faulds....	183 „ 190

Digitized by Google

Digitized by Google

REVIEW OF THE INTRODUCTION OF CHRISTIANITY INTO CHINA AND JAPAN,

BY

JOHN H. GUBBINS, Esq.,

H. B. M.'s Consular Service, Japan.

Read before the Asiatic Society of Japan, on the 27th October, 1877.

—o—

I.

For a long time it was generally believed that Christianity was first introduced into China in the middle of the 13th century, and this belief held its ground in spite of vague rumours of missionaries having penetrated to Central Asia and China at a time anterior to that of the Crusades, and in spite of the mention made of Nestorian missionaries by Marco Polo. And there was much to support this belief, for the missionaries of the 13th century and those who followed two centuries later, sought long in vain for any traces of the previous existence of Christianity in the country; and it was only in the year 1625 that a discovery was made which shewed conclusively not only that Christianity had been introduced into China in ancient times, but that successive introductions had taken place, these earlier efforts being due to Nestorian missionaries.

Nearly all writers who have examined the subject have agreed in conceding the authenticity of the Stone at

Digitized by Google

Singanfu, to the inscription on which we are indebted for so much information. From this inscription—a facsimile of which is given in an old book on China written by a missionary named Kirchere,—we learn that in the 6th, 7th and 8th centuries missionaries were successively sent to China by the Nestorian Church in Armenia, and that their efforts towards the conversion of the Chinese were attended with considerable success. Christian communities were founded in numerous places with ramifications extending throughout the Empire. The Nestorians appear to have carried on their operations uninterruptedly, until they met with a fierce persecution at the hands of Genghis Khan, from which time they rapidly dwindled away in numbers, and disappeared with the downfall of the Mongol Dynasty in A.D. 1369.

During the last century of their residence in China, the Nestorians were joined by missionaries of the Roman Catholic Church. In 1246 Carpina was sent on a mission to the Tartars of Mongolia by Pope Innocent IV, and he was followed a few years later by another papal legate named Rubruk, who was sent on a similar special mission. The first Roman Catholic missionary to settle in China was Jean de Corvin, a monk of the order of Minorites. Owing to the jealousy and opposition of the Nestorians, who according to one authority cited by Le Huc numbered about 30,000, some years elapsed before he succeeded in establishing any footing in the country. At length in 1307 he succeeded so far as to be appointed Archbishop by Pope Clement V, who detached several other monks to assist him in his mission. According to Le Huc, Corvin, at his death in 1330, left behind him a flourishing Christian community. Be this as it may, its vitality was small, for forty years later no trace of it was left. Williams, in his History of China, is of opinion that the Roman Catholic missionaries, like the Nestorians, were concentrated chiefly round the Mongol Court, on which they relied for protection, and that they shared the fate of their patrons on the overthrow of that dynasty.

Nothing daunted by previous failure, two centuries later,

Digitized by Google

the Roman Catholic Church made a second effort to introduce Christianity into China, and the close of the 16th century saw the Jesuits in the Chinese Empire. It may be that the previous failure is connected with the fact that they had no convenient basis from which to direct their efforts. Since then, however, the colony of Macao had been formed. In 1517 D'Andrada, envoy from the Viceroyalty of Goa, obtained from the Chinese Government the concession of a narrow strip of land close to Canton, and here the energy of the Portuguese soon established a settlement which in the course of half a century had attained to a flourishing condition, and served as a natural *point d'appui* for the Jesuit Mission. The seminaries and convents of Macao were the schools in which were trained the men who afterwards went through such hardships in the propagation of their faith in China and Japan, and have left such numerous records of their courage and perseverance, and here, as each successive wave of persecution swept over the country and drove them to take refuge elsewhere, they were enabled to rally their forces, and when occasion served, to recommence their work with fresh vigour.

In this second introduction the difficulties which the missionaries encountered were perhaps greater than before. They first entered China by way of Canton in 1581, but they were forced to return to Macao, and it was not till the year 1583, after three successive failures, that they finally gained a footing in that town, where by the favour of the Viceroy they were allowed to work unmolested.

The four who thus led the way were Ricci, Roggiero, Paccio, and Duarte, and they at once set themselves to the task of acquiring the language. That this proved their greatest obstacle at the outset can well be imagined, and Semedo, who followed later on, in his history of China says as much. The words in which he modestly speaks of the difficulty experienced by his brother missionaries and himself might be said equally well of those pioneers in the Japanese language, to whom after-students owe so much.

Digitized by Google

"The language," says Semedo, "seemeth more difficult "than any in the world, being curt and equivocal, and in this "difficulty the Fathers were without any master to teach "them, without any interpreter to explain what was said "to them; so that they neither understood others nor "others them; but by force of diligence and unwearied "pains they went on conquering and gaining; and al- "though they never arrived at any perfection in the lan- "guage or good accent in pronouncing it; yet they dis- "covered the mysteries of that tongue and set them down "in so plain a form that they made it much more easy for "those who came after them."

The missionaries at first donned the garb of Buddhist priests, but finding afterwards that the dress of the *literati*, or learned class, commanded more respect, they changed it for the latter.

Ricci soon proved himself the most able of the four. In 1594 he succeeded in forming a community in Soochow, the capital of Kiang-Si, and four years later he was enabled to do the same at Nanking, where he acquired considerable reputation by his lectures on the exact sciences. In 1601 he had so far ingratiated himself with the authorities that we find him settled at the Court of Peking, where he was joined by other missionaries and gained many converts, some of these being men of distinction in in the Empire. Le Huc gives an amusing account of the delight shewn by the Emperor and the Court generally with the wonderful clock which was among the presents given by Ricci. The story runs that the Empress-mother, hearing of the clock, expressed a desire to see it. The Emperor unwilling to incur the charge of filial disobedience, and at the same time fearing lest the precious object of curiosity should be kept from him altogether, took the precaution of sending the clock unwound. The Empress-mother soon tired of the toy when in that state, and restored it to its anxious owner.

Ricci continued to reside at the court until his death in the year 1610, and up to that time and until the year 1617, when the first edict of expulsion was issued, the

Digitized by Google

missionaries in the North of China appear to have enjoyed the constant protection of the Government. Even then, so strong was the influence they had at Peking, that they were able to brave the fiat of expulsion; and disregarding that decree they busied themselves at the capital in the intervals of their preaching with translating and publishing various works in the Chinese language.

There is a discrepancy in the various accounts on this point, some writers stating that the Jesuits at the capital shared the general fate of the missonaries, while others favour the view that an exception was made in the case of those at Peking. The latter view is probably correct, as it is borne out by what happened during a subsequent banishment of the missionaries; or it may be that some only of the missionaries at Peking were allowed to remain, the rest sharing in the general expulsion.

Meanwhile the position of the missionaries in the Provinces had been very variable, and they had been subjected to several persecutions. Nanking was the place where they met with the greatest hostility. Driven out of that city in 1613, on their re-establishment there in 1616 they were arrested by the Head Official of the Local Branch of the Lipu department, and were treated with such hardship and severity that two of their number died in confinement. After a lengthened imprisonment they were brought to trial at the time that the edict of the following year (1617) was issued, and sentenced to banishment, their goods and houses being confiscated. The way in which the order was carried out is thus described by Semedo, who was treated more leniently than the others on account of his sick condition.

"They were thrust into narrow cages of wood (such as "are used in China to transport criminals condemned to "death from one place to another), iron chains were hung "round their necks, manacles were fastened to their "wrists; their hair was allowed to hang straight down, "and their gowns put upon them in a strange uncouth "manner that they might look like the people of a "savage and barbarous country. In this way they were

Digitized by Google

"brought out on the 30th April, their cages were sealed "with the Imperial seal, orders being given to the guard "to allow them out only at such times as were neces- "sary for eating and sleeping; three tablets were "carried before them on which their sentence was "inscribed and also a notice forbidding any one to have "any communication with them. Arrived at Canton "they were taken out and sent back to Macao along with "the fathers who had left Peking."

Imitating the careless bravery of their brethren in Japan, the banished missionaries soon contrived to re-enter the country, and for some time until their prospects improved they dispersed and remained secreted in various parts of the Empire. Nor had they long to wait. In 1628 Schaal, who had succeeded Ricci in the leadership of the Jesuits, was installed in his predecessor's position of Astronomer to the Court, and by that time the missionaries had recovered their former status, and their preaching, especially in the Central Provinces, was favoured with marked success. By the year 1632 there were flourishing Christian communities in the Provinces of Kiang-Si, Honan, and Szechuen, with headquarters at Peking, Hancheu, Shensi, and Nanking.

We can sympathize with Semedo's feeling of gratification when he says:—"To this state and condition is the "Church of China arrived after the continual labor and "pains of the Fathers during 58 years;—and truly so "happy and prosperous a success could never have been "expected from such difficult beginning and such weak "means."

"On their return to Peking," says the same writer, "the Fathers lost no time in placing themselves under "the protection of the Lipu department lest they should "be called upon by the War Office to lend their services "in warding off the Tartar invasions, and having repaired "their Church they established themselves in their old "quarters. And there," the old chronicler proceeds to state with quaint satisfaction," they do yet inhabit to this "very day (1638), meddling only with such things as

Digitized by Google

"belong to their profession without ever being spoken to "concerning wars, Tartars or arms."

About this time the Jesuits were joined by the *réligieux* of other orders, Dominicans, Lazarists and Franciscans.

The Manchu invasion and the disorder which followed in the years between 1630-60, were naturally unfavourable to the progress of Christianity, but the position of the missionaries at Court remained unaltered. The new dynasty extended its protection to the Jesuits, and Schaal being engaged to reform the calendar, was honoured with a high rank and received permission to introduce other members of his order. During the reign of Shunche the missionaries continued in favour, but on his death in 1665 an edict was issued against them, and many were sent out of the country, while others, among whom was Verbiest, were imprisoned. Schaal's death at this time is attributed to grief and mortification at the disastrous state to which the mission was reduced.

It is said, and with some appearance of truth, that the strife which began to arise amongst the members of various orders about this time, was one of the causes which led to this second persecution. Considerable dissatisfaction had already been caused in the Jesuit body by the policy which Ricci had instituted, and the adoption of which he had enjoined on his followers, in regard to the Ancestral Rites practised by the Chinese. The less liberal of the fraternity argued that this was a concession to Paganism which should never have been made. (Ricci's motives in giving it are of course apparent. His missionary experience had soon shewn him that the relinquishment of this ancient practice was one of the greatest obstacles in the way of conversion.) On the arrival of other *réligieux* the supporters of Ricci's policy found themselves outnumbered, and the contentions on this and other points—amongst which were the meanings of the terms *Tien* and *Shang-ti*—grew at last to such a pitch that in 1645 the Vatican thought fit to interfere, and a Bull of Pope Innocent X decided against Ricci's adherents and the Jesuits generally. This decision was reversed in 1656 by a Bull of Pope Alex-

Digitized by Google

ander VIII, to which the body of the missionaries submitted; but the question was again raised in 1693, when an ultimate decree was pronounced by Pope Clement XI, by which the practice by converts of the Ancestral and other Rites was disallowed.

Williams, in his notice of Christianity, enters at length into this question, and says that the Emperor Kang-hi was opposed to the views of the Vatican, and that this latter Bull was strenuously resisted by the Jesuits.

Though scattered and dispersed by the edict of 1665, the missionaries did not remain long under a cloud, and six years afterwards, on the accession of the Emperor Kang-hi, they were restored to their former favour, Verbiest being appointed Astronomer Royal.

In 1687 the French missions were established, their object, so Le Huc says, being as much to gain information for the French academy as to propagate Christianity.

* The first eighteen years of the 18th century saw Christianity at its greatest height of prosperity in China. It is stated that at this time there were in two of the provinces alone upwards of a hundred churches, and more than a hundred thousand converts. It was at this time that a survey of the Empire was carried out under the direction of the Jesuits.

In 1718 Kang-hi, either resenting the action of the Vatican or yielding to the persuasion of the circle of Jesuits round him, issued an edict forbidding the residence in China of all missionaries who did not subscribe to the rules affecting ancestral worship laid down by Ricci, and before his death it is said that he even went so far as to countenance the persecution of Christian converts.

On Kanghi's death in 1723 Christianity suffered a third persecution, from the effects of which it has never recovered. In 1732 one of the French missionaries wrote home, "What we have been dreading for so many years has at "length come to pass; our religion is entirely proscribed "in China, and all the missionaries except those at

* "The Chinese Empire," by Williams.

Digitized by Google

"Peking (who were employed at Court as mathematicians under the title of *artists* and *learned men*) have "been driven from the Empire."

During the whole of Yung-tching's reign persecution continued, and though under the administration of his successor, Kien-lung, the missionaries recovered to some extent their credit at Court, the tide of persecution in the provinces never entirely stopped. The suppression of the religious orders and the political commotions which convulsed Europe towards the end of the 18th century, exercised a baneful effect upon the cause of Christianity, and missionaries and converts alike unsupported by aid from without, and harassed by local persecutions, gradually decreased in numbers and influence.

Notwithstanding that within the last thirty years a slight re-action has set in, owing to the altered conditions under which the operations of the missionaries are necessarily conducted, the progress has been slow; and there seems little probability of the missionaries regaining the position which they occupied in the days of Ricci, Adam Schaal and Verbiest.

II.

It was to Portuguese enterprise that Christianity owed its introduction into Japan in the XVI century. As early as 1542 Portuguese trading vessels began to visit Japan, where they exchanged western commodities for the then little known products of the Japanese Islands; and seven years afterwards three Portuguese missionaries, Xavier, Torres, and Fernandez, took passage in one of these merchant ships and landed at Kagoshima.

The leading spirit of the three, it need scarcely be said, was Xavier, who had already acquired considerable reputation by his missionary labours in India. After a short residence the missionaries were forced to leave Satsuma, and after as short a stay in the island of Hirado, which appears to have been then the rendezvous of trade between the Portuguese merchants and the Japanese, they crossed over to the mainland and settled down in Yamaguchi in Nagato, the chief town of the territories of the

Digitized by Google

Prince of Chôshiu. After a visit to the capital which was productive of no result, owing to the disturbed state of the country, Xavier left Japan with the intention of founding a Jesuit mission in China, but died on his way in the island of Sancian.

In 1553 fresh missionaries arrived, some of whom remained in Bungo, where Xavier had made a favourable impression before his departure, while others joined their fellow-missionaries in Yamaguchi. After having been driven from the latter place by the outbreak of disturbances, and having failed to establish a footing in Hizen, we find the missionaries in 1557 collected in Bungo, and this province appears to have become their head-quarters from that time. In the course of the next year but one, Vilela made a visit to Kiôto, Sakai, and other places, during which he is said to have gained a convert in the person of the *daimiô* of the small principality of Ômura, who displayed an imprudent excess of religious zeal in the destruction of idols and other extreme measures, which could only tend to provoke the hostility of the Buddhist priesthood. The conversion of this prince was followed by that of Arima no kami (mistakenly called the Prince of Arima by the Jesuits).

Other missionaries arriving in 1560, the circle of operations was extended, but shortly afterwards the revolution headed by Môri compelled Vilela to leave Kiôto where he had settled, and a simultaneous outbreak in Ômura necessitated the withdrawal of the missionaries stationed there. Môri of Chôshiu was perhaps the most powerful noble of his day, possessing no fewer than ten provinces, and as he was throughout an open enemy to Christianity, his influence was exercised against it with much ill-result.

On Vilela's return to Kiôto from Sakai, where a branch mission had been established, he succeeded in gaining several distinguished converts. Amongst these were Takayama, a leading general of the time, and his nephew. He did not, however, remain long in the capital; the recurrence of troubles in 1568 made it necessary for him to withdraw, and he then proceeded to Nagasaki, where

Digitized by Google

he met with considerable success. In this same year we come across Valegnani preaching in the Gotô Isles, and Torres in the island of Seki, where he died. Almeida, too, about this time founded a Christian community at Shimabara, afterwards notorious as the scene of the revolt and massacre of the Christians.

Hitherto we find little mention of Christianity in Japanese books. This may partly be explained by the fact that the labours of the missionaries were chiefly confined to the southern provinces, Christianity having as yet made little progress at Kiôto, the seat of literature. But the scarcity of Japanese records can scarcely be wondered at in the face of the edict issued later in the next century, which interdicted not only books on the subject of Christianity, but any book in which even the name of *Christian* or the word *Foreign* should be mentioned.

Short notices occur in several native works of the arrival in Kiôto at this date of the Jesuit missionary Organtin, and some curious details are furnished respecting the progress of Christianity in the capital and the attitude of Nobunaga in regard to it.

The "*Saikoku Kirishitan Bateren Jitsu Roku*", or "True Record of Christian Padres in Kiushiu", gives a minute account of the appearance and dress of Organtin, and goes on to say:—"He was asked his name and why "he had come to Japan, and replied that he was the "Padre Organtin and had come to spread his religion. "He was told that he could not be allowed at once to "preach his religion but would be informed later "on. Nobunaga accordingly took counsel with his "retainers as to whether he should allow Christianity "to be preached or not. One of these strongly "advised him not to do so, on the ground that there "were already enough religions in the country. But No-"bunaga replied that Buddhism had been introduced from "abroad and had done good in the country, and he there-"fore did not see why Christianity should not be granted "a trial. Organtin was consequently allowed to erect a "church and to send for others of his order, who when

Digitized by Google

"they came were found to be like him in appearance. "Their plan of action was to tend the sick and relieve "the poor, and so prepare the way for the reception of "Christianity, and then to convert everyone and make the "sixty-six provinces of Japan subject to Portugal."

The "*Ibuki Mogusa*" gives further details of this subject and says that the Jesuits called their church *Yeiroku-ji* after the name of the period in which it was built, but that Nobunaga changed the name to "*Nambanji*" or "Temple of the Southern Savages." The word *Namban* was the term usually applied to the Portuguese and Spaniards.

During the next ten years Organtin and other missionaries worked with considerable success in Kiôto under Nobunaga's immediate protection. This period is also remarkable for the conversion of the Prince of Bungo, who made open profession of Christianity and retired into private life, and for the rapid progress which the new doctrine made amongst the subjects of Arima-no-kami. This good fortune was again counterbalanced by the course of events in the Gotô Islands, where Christianity lost much ground owing to a change of rulers.

Ten years thus passed away, when the Christian communities sustained a great loss in the disgrace of Takayama, who was banished to Kaga for taking part in an unsuccessful intrigue against Nobunaga which was headed by the Prince of Chôshiu. Takayama's nephew, Ukon, however, declared for Nobunaga, and the latter gave a further proof of his friendly feeling towards Christianity by establishing a church in Adzuchi-no-shiro, the castle town which he had built for himself in his native province of Ômi.

In 1582 a mission was sent to the Papal See on the part of the Princes of Bungo and Ômura, and Arima-no-kami. This mission was accompanied by Valegnani, and reached Rome in 1585, returning five years later to Japan.

In the following year Nobunaga was assassinated and Hideyoshi, who succeeded him in the chief power, was content for the first three or four years of his administration

Digitized by Google

to follow in the line of policy marked out by his predecessor. Christianity, therefore, progressed in spite of the drawbacks caused by the frequent feuds between the southern *daimiôs*, and seminaries were established under Hideyoshi's auspices at Ôsaka and Sakai. During this period Martinez arrived in the capacity of bishop; he was charged with costly presents from the Viceroy of Goa to Hideyoshi, and received a favorable audience.

Hideyoshi's attitude towards Christianity at this time is easily explained. The powerful southern barons were not willing to accept him as Nobunaga's successor without a struggle, and there were other reasons against the adoption of too hasty measures. Two of his generals, Kondera, and Konishi Setsu-no-kami,—who afterwards commanded the 2nd division of the army sent against Corea,—the Governor of Ôsaka and numerous other officers of state and nobles of rank and influence had embraced Christianity, and the Christians were therefore not without influential supporters. Hideyoshi's first act was to secure his position. For this purpose he marched into Kiushiu at the head of a large force and was everywhere victorious. This done, he threw off the mask he had been wearing up to this time, and in 1587 took the first step in his new course of action by ordering the destruction of the Christian church at Kiôto,—which had been in existence for a period of eighteen years—and the expulsion of the missionaries from the capital.

It will be seen by the following extract from the *Ibuki Mogusa* that Nobunaga at one time entertained designs for the destruction of Nambanji.

"Nobunaga", we read, "now began to regret his previ-
"ous policy in permitting the introduction of Christianity.
"He accordingly assembled his retainers and said to
"them:—'The conduct of these missionaries in persuading
"'people to join them by giving money does not please me.
"'It must be, I think, that they harbour the design of seiz-
"'ing the country. How would it be, think you, if we were
"'to demolish Nambanji.' To this Mayéda Tokuzenin
"replied:—'It is now too late to demolish the temple of

Digitized by Google

"'Nambanji. To endeavour to arrest the power of this "'religion now is like trying to arrest the current of the "'ocean. Nobles both great and small have become "'adherents of it. If you would exterminate this religion "'now there is fear lest disturbances be created even "'amongst your own retainers. I am therefore of opinion "'that you should abandon your intention of destroying "'Nambanji.' Nobunaga in consequence regretted ex- "ceedingly his previous action with regard to the Chris- "tian religion, and set about thinking how he could root "it out."

The Jesuit writers attribute Hideyoshi's sudden change of attitude to three different causes, which are given in detail in Charlesvoix's book, but it is clear that Hideyoshi was never favourable to Christianity and that he only waited for his power to be secure before taking decided measures of hostility. His real feeling in regard to the Christians and their teachers is explained in the "Life of Hideyoshi", from which work we learn that even before his accession to power he had ventured to remonstrate with Nobunaga for his policy towards Christianity.

Hideyoshi's next act was to banish Takayama Ukon to Kaga, where his uncle already was, and he then in 1588 issued a decree ordering the missionaries to assemble at Hirado and prepare to leave Japan. They did so, but finding that measures were not pushed to extremity they dispersed and placed themselves under the protection of various nobles who had embraced Christianity. The territories of these Princes offered safe asylums, and in these scattered districts the work of Christianity progressed secretly while openly interdicted.

In 1591 Valegnani had a favourable audience of Hideyoshi, but he was received entirely in an official capacity, namely in the character of envoy of the Viceroy of Goa.

Christianity was at its most flourishing stage during the first few years of Hideyoshi's administration. We can discern the existence at this date of a strong Christian party in the country, though the turning point had been reached, and the tide of progress was on the ebb. It is

Digitized by Google

to this influence probably, coupled with the fact that his many warlike expeditions left him little leisure to devote to religious questions, that we must attribute the slight relaxation observable in his policy towards Christianity at this time.

"Up to this date," says Charlevoix, "Hideyoshi had not "evinced any special bitterness against Christianity, and "had not proceeded to rigorous measures in regard to "Christians. The condition of Christianity was re-assur- "ing.* Rodriguez was well in favour at Court, and Or- "gantin had returned to Kiôto along with several other "missionaries, and found means to render as much as- "sistance to the Christians in that part of the country as "he had been able to do before the issue of the edict "against Christianity by Hideyoshi."

The inference which it is intended should be drawn from these remarks, taken with the context, is clear,—namely that had the Jesuits been left alone to prosecute the work of evangelizing Japan, the ultimate result might have been very different. However, this was not to be.

Hitherto for a period of 44 years the Jesuits had it all their own way in Japan, latterly by virtue of a Bull issued by Pope Gregory XIII, in 1585 (the date of the appointment of the 1st Bishop and of the arrival at Rome of the Japanese Mission), and subsequently confirmed by the Bull of Clement III in 1600—by which the *réligieux* of other orders were excluded from missionary work in Japan. The object of these Papal decrees was, it seems, to ensure the propagation of Christianity on an uniform system. They were, however, disregarded when the time came, and therefore, for a new influence which was brought to bear upon Christianity at this date—not altogether for its good, if the Jesuit accounts may be credited—we must look to the arrival of an embassy from the Governor of the Phillippines, whose Ambassador was accompanied by four Franciscan priests.

* Rodriguez seems to have been to the Jesuit Mission in Japan in a smaller degree what Ricci was to that in China.

Digitized by Google

These new arrivals when confronted by the Jesuits with the Papal Bull declared that they had not transgressed it, and defended their action on the ground that they had come attached to an embassy and not in the character of missionaries; but they argued at the same time with a casuistry only equalled by their opponents, that having once arrived in Japan there was nothing to hinder them from exercising their calling as preachers of Christianity.

The embassy was successful, and Baptiste who appears to have conducted the negotiations in place of the real envoy, obtained Hideyoshi's consent to his shrewd proposal that pending the reference to Manila of Hideyoshi's claim to the sovereignty of the Phillippines he and his brother-missionaries should remain as hostages. Hideyoshi, while consenting, made their residence conditional on their not preaching Christianity—a condition which it is needless to say was never observed.

Thus at one and the same time the Spaniards, who had long been watching with jealous eyes the exclusive right of trade enjoyed by the Portuguese, obtained an opening for commerce, and the Franciscans a footing for their religious mission.

It was not long before the newly arrived missionaries were called upon to prove their devotion to their cause. In 1593, in consequence, says Charlevoix, of the indiscreet statements of the pilot of a Spanish galleon, which being driven by stress of weather into a port of Tosa was seized by Hideyoshi, nine missionaries, namely six Franciscans and three Jesuits, were arrested in Kiôto and Ôsaka, and having been taken to Nagasaki were there burnt. This was the first execution carried out by the Government.

Hideyoshi died in the following year (1594), and the civil troubles which preceded the succession of Iyeyasu to the post of Administrator, in which the Christians lost their chief supporter Konishi, who took part against Iyeyasu, favoured the progress of Christianity, in so far as diverting attention from it to matters of more pressing moment.

Digitized by Google

Iyeyasu's policy towards Christianity was a repetition of his predecessor's. Occupied entirely with military campaigns against those who refused to acknowledge his supremacy, he permitted the Jesuits, who now numbered one hundred, to establish themselves in force at Kiôto, Ôsaka, and Nagasaki. But as soon as tranquillity was restored, and he felt himself secure in the seat of power, he at once gave proof of the policy he intended to follow by the issue of a decree of expulsion against the missionaries. This was in 1600. The Jesuit writers affirm that he was induced to withdraw his edict in consequence of the threatening attitude adopted by certain Christian nobles who had espoused his cause in the late civil war, but no mention is made of this in the Japanese accounts.

So varying, and indeed altogether unintelligible was the action of the different nobles throughout Kiushiu in regard to Christianity during the next few years, that we see one who was not a Christian offering an asylum in his dominions to several hundred native converts who were expelled from a neighbouring province ; another who had systematically opposed the introduction of Christianity actually sending a mission to the Phillippines to ask for missionaries ; while a third who had hitherto made himself conspicûous by his almost fanatical zeal in the Christian cause, suddenly abandoned his new faith, and from having been one of its most ardent supporters, became one of its most bitter foes.

The year 1602 is remarkable for the despatch of an embassy by Iyeyasu to the Phillippines, and for the large number of *réligieux* of all orders who flocked to Japan.

Affairs remained *in statu quo* for the next two or three years, during which the Christian cause was weakened by the death of two men which it could ill afford to lose. One of these was the noble called Kondera by Charlevoix, but whose name we have been unable to trace in Japanese records. The other was Organtin, who had deservedly the reputation of being the most energetic member of the Jesuit body.

Digitized by Google

The number of Christians at this time in Japan is stated to have been 1,800,000. The number of missionaries was of course proportionally large, and was increased by the issue in 1608 of a new Bull by Pope Paul V, allowing to *réligieux* of all orders free access to Japan.

The year 1610 is remarkable for the arrival of the Dutch, who settled in Hirado, and for the destruction in the harbour of Nagasaki of the annual Portuguese galleon sent by the traders of Macao. In this latter affair, which arose out of a dispute between the natives and the people of the ship, Arima-no-kami was concerned, and his alliance with the missionaries was thus terminated.

In 1611 no less than three embassies arrived in Japan from the Dutch, Spanish and Portuguese respectively, and in 1613 Saris succeeded in founding an English Factory in Hirado, where the Dutch had already established themselves. It was early in the following year that Christianity was finally proscribed by Iyeyasu. The decree of expulsion directed against the missionaries was followed by a fierce outbreak of persecution in all the provinces in which Christians were to be found, which was conducted with systematic and relentless severity.

The Jesuit accounts attribute this resolution on the part of Iyeyasu to the intrigues of the English and Dutch traders. Two stories, by one of which it was sought to fix the blame on the former, and by the other on the latter, were circulated, and will be found at length in Charlevoix's History.

We have no wish to enter upon a defence either of our countrymen or of the Dutch, and fully admit the possibility of such intrigues having occurred. Indeed, considering in what relations both Spaniards and Portuguese stood at that time to both of the other nations, and how high religious feeling ran in the seventeeth century, it would be strange if some intriguing had not taken place. Still we should like to point out that there were, we think, causes other than those to which the Jesuit writers confine themselves, quite sufficient in themselves to account for

Digitized by Google

the extreme measures taken against Christianity at this date.

There was the predetermination against Christianity already shewn by Iyeyasu; there were the new avenues of trade opened up by the arrival of the English and Dutch; there was the increased activity displayed by the missionaries at a time when Christianity was in a weak state, and lastly there was the influence of the Buddhist priesthood.

That this edict of expulsion issued by Iyeyasu was the effect of no sudden caprice on his part, is clear from the general view which we have of his whole policy, which was similar to that of his predecessor. His early tolerance of Christianity is susceptible of the same explanation as that shewn by Hideyoshi. His mind was evidently made up, and he was only biding his time.

It is also highly probable that the new facilities for trade offered by the advent of the Dutch and English may have had some influence upon the action of Iyeyasu. It is impossible that he can have been altogether blind to the fact that the teaching of Christianity had not been unattended with certain evils, dangerous, to say the least, to the tranquillity of the country, and it cannot have escaped his notice, that whereas the respective admissions of Portuguese and Spaniards had been followed by the introduction of Christian missionaries, who in numbers far exceeded the traders, the same feature was not a part of the policy of the two other nations whose proceedings had no connection whatsoever with religion. Possibly, too, reports may have reached his ears of the growing supremacy of the Dutch in the East, and have induced him to transfer his favour from the Portuguese and Spaniards to the new arrivals.

As regards the condition of Christianity at this time, the Jesuit accounts supply as with facts which shew that numerically speaking the Christian cause was never so strong as at this period. There were some two millions of converts whose spiritual concerns were administered by no fewer than 200 missionaries, three-fourths of whom

Digitized by Google

were Jesuits. According to the "*Kerisuto-ki*," a native work, there were Christian Churches in every province of Kiushiu except Hiuga and Ôsumi, and also at Kiôto, Ôsaka, Sendai, and Kanagawa in Kaga; and it was only in eight provinces of Japan that Christianity had gained no footing. An increased activity in the operations of the missionaries is discernible about this time. The Dominicans in Satsuma, the Franciscans in Yedo, and the Jesuits in the Capital and Southern Provinces seem to have been vying with each other which should gain most converts; and the circuit made by Cerqueyra in which he visited all the Jesuit establishments throughout the country was probably not without effect in exciting fresh enthusiasm among the converts everywhere, which again would naturally draw attention to the progress of Christianity. But strong as the position of the Christians was numerically, we must not judge of the strength of their cause merely by the number of converts, or by the number of missionaries resident in Japan. If we consider the facts before us we find that Christianity lacked the best of all strength,—influence in the state. All its principal supporters amongst the aristocracy were either dead, had renounced their new faith, or were in exile; and here we have the real weakness of the Christian cause. Whilst therefore circumstances combined to draw attention to its progress, it was in a state which could ill resist any renewed activity of persecution which might be the result of the increased interest which it excited. Without influence at the Court and without influence in the country, beyond what slight influence the mass of common people scattered through various provinces, who were Christians, might be said to possess, Christianity presented itself assailable with impunity.

The last cause we have mentioned as being probably connected with the decisive measures adopted by Iyeyasu is the influence of the Buddhist priesthood. Japanese history mentions the great power attained by the priesthood prior to Nobunaga's administration. Although that power was broken by Nobunaga, Hideyoshi did not in-

Digitized by Google

herit the former's animosity towards the priests, and Iyeyasu from the first came forward as their patron.

And again we must not lose sight of the fact that a deep-rooted suspicion of foreigners was ever present in the minds of the Japanese Government; a suspicion, which the course of events in China,—of which we may presume the Japanese were not altogether ignorant—the jealousy of the native priests, the control of their converts exercised by the missionaries which doubtless extended to secular matters, the connection of Christianity with trade, and the astounding progress made by it in the space of half a century,—all tended to confirm.

Enough has been said, we think, to show that we need not go so far as the intrigues, real or imaginary, of the English and Dutch, to look for causes for the renewed stimulus given at this date to the measures against Christianity.

In the following year (1614) the edict was carried into effect, and the missionaries, accompanied by the Japanese princes who had been in exile in Kaga, and a number of native Christians, were made to embark from Nagasaki.

Several missionaries remained concealed in the country, and in subsequent years not a few contrived to elude the vigilance of the authorities and to re-enter Japan. But they were all detected sooner or later, and suffered for their temerity by their deaths.

Persecution did not stop with the expulsion of the missionaries, nor at the death of Iyeyasu was any respite given to the native Christians. And this brings us to the closing scene of this history—the tragedy of Shimabara. In the autumn of 1637 the peasantry of a convert district in Hizen, driven past endurance by the fierce ferocity of the persecution, assembled to the number of 30,000, and fortifying the castle of Shimabara declared open defiance to the Government. Their opposition was soon overborne; troops were sent against them, and after a short but desperate resistance all the Christians were put to the sword. With the rising of Shimabara and its sanguinary

Digitized by Google

suppression by the Government, the curtain falls on the early history of Christianity in Japan.

III.

From the foregoing sketches of the course of Christianity in both countries it will be seen at once that there is little similarity between the two. Dismissing the earlier attempts to introdnce Christianity in China, scant traces of which were left when the later work was commenced, we find that this similarity begins and ends with the fact that the missionaries in each case were Portuguese by nationality and Jesuits by creed.

The conditions under which missionary work was instituted in the two countries could hardly have been more antagonistic. In China there existed a despotic monarchy, and the system of Government was centralization; in Japan the despotic monarchy was but a name, and the country though nominally under one head was in reality divided amongst a number of powerful chieftains, who ruled their territories and vassals each according to his own individual will.

Under the Ming dynasty China was in a prosperous condition. The Mongol yoke had been thrown off, and under the energetic government of Hungwu and his successors, the administration was placed on a firm basis, the condition of the people was improved, and the country at large profited by the advantages of peace and independence until again disturbed by the victorious campaign of the Eastern or Manchu Tartars in 1640, and the civil wars which lasted until 1660. It is true that the Tartar bands from Manchuria, were beginning to prove themselves troublesome about the time that Christianity was introduced, but their inroads did not extend far beyond the northern frontier, and the rest of China was little affected by the fighting on the border.

On the other hand Japan was never perhaps in a state of greater internal discord than when missionaries first landed on its shores. Such a scene of intestine strife and anarchy as the country presented at this period can be

Digitized by Google

found in the annals of few nations. The feudal barons were engaged in the prosecution of fierce feuds one with another by the aid of mercenary bands, which roamed at large, the terror of the country people, ready to enrol themselves under any banner which could pay for their services. The Mikado was a nonentity; the Court, Shôgun and Kugé were alike powerless to restore order; and to such a pitch had matters come that the monks donned armour for the occasion, and at the head of armed hosts added fuel to the fire that was raging, and took advantage of the prevailing uproar to settle questions of dogma with their co-religionists by the arbitrament of the sword.

Entering as Christianity did into the two countries under conditions so entirely different, it is no wonder that the characteristics of its progress should be dissimilar.

In China, owing to the vigilant system of police, it was only after repeated failures that the missionaries were at length able to effect a commencement. Introduced into Japan under cover of the general confusion, Christianity worked its way silently for eighteen years, and had made considerable progress before the nation was fully alive to the fact of its existence. Whilst, therefore, on the one hand, we see the new religion making rapid progress in an obscure locality of Japan, on the other hand in China there is the spectacle of a new doctrine fighting its way up hill, beset from the very outset by obstacles which would have crushed a less dogged perseverance. Half a century saw Christianity rise to a height of prosperity in Japan, which it did not attain in China until a century later.

The Portuguese Jesuits being the first in the field of missionary labour both in China and Japan, it follows that the systems on which they went to work were to a certain extent similar. Still the *modus operandi* was in each case very different. In China the missionaries spread themselves over a large area, and from the very first conducted their operations on as large a scale as possible, which in Japan, owing to the peculiar condition of the country, was

Digitized by Google

impossible. Although in each case the importance of securing a footing in the capital appears to have been fully recognized, the missionaries in Japan were not so successful in this respect as their brethren in China. The protection of the Court was throughout the strong point in the latter's favour. In China, moreover, the missionaries had a great advantage in having Macao close at hand as a basis from which to work, and the regular supplies which they received from this quarter, joined to the settled state of the country, enabled them to establish communities in various places which could without any very great difficulty communicate regularly with each other. The method of work was thus better organized and more thorough than that in Japan; lastly the adoption of the garb of *literati* enabled them more easily to escape detection by the Chinese authories.

Though Macao was of great use to the Japanese missionaries, as they obtained their supplies indirectly from thence, still navigation being then comparatively in its infancy, it was too far to be of the same service to them as to their compatriots in China. At first their only port of supply was in Hirado, and communication could not have been very frequent, for later on, when Nagasaki had taken the place of Hirado as the place of call for Portuguese vessels, we read that they only received their supplies once a year by means of an annual galleon sent by the traders of Macao. We have already alluded to the unsettled state of the country which had the effect of localizing their work. Pagés, too, speaks of the Jesuits being much hampered in their operations by the want of funds. How the other orders received their supplies, and how and by whom they were maintained is not clear, but the Jesuits depended entirely on the subsidies from the Pope and the King of Portugal; and upon these, the payment of which we are told was sadly irregular, and such charitable alms as they received from different sources, they subsisted. The Jesuits had thus from the first been unable to extend their operations to the northern provinces of Japan, owing to the necessity they were

Digitized by Google

under of keeping within reach of their port of supply. But the footing for trade gained by the Spaniards, which resulted in the throwing open to them of various Ports in the N. E. of the country, enabled the Franciscans to establish themselves in the neighbouring districts.

The policy adopted by the Jesuits in regard to their Missions is well described by one of their writers. He says :—"The zeal and heat of those persons who would "convert the world perfectly on a sudden is much to be "commended; and we do esteem and reverence it "in all; nevertheless in new missions and particularly in "such which are not susceptible of this fire which flameth "out so suddenly, but do require to be disposed to it by "longer time, we do endeavour to retain them within the "limits of prudence more safe, and the bounds of patience "more profitably for that which is pretended to by our "Society, whenever we meet with any of such a spirit "among us; and if that will not serve, we send them to "the pulpits and auditories of Europe, where that fire "may shine out without any danger of burning. And "this is observed by us in order to the Gentiles."

Ricci was a perfect specimen of the Jesuit missionary considered suitable to China. He is described as possessing "a zeal courageous and indefatigable, but wise, patient, "and circumspect, slow that it might be more efficacious, "and timid in order to dare the more."

It is possible that the rapidity of the progress which Christianity in Japan made in the districts to which it was confined may have made the missionaries generally more careless, but the prudence and patience above mentioned were certainly not distinguishing features of the Franciscans in Japan. Their indiscretion is allowed on all sides. At a time when the suspicions of the Government were aroused, and a prohibitory edict had been issued, these zealous preachers of the Christian faith went about openly in all parts of the country, assuming no disguise, and disdaining the use even of ordinary precautions.

Digitized by Google

The bad feeling which existed between the different orders must have worked much harm to the cause of Christianity in both countries. In China the advisibility of permitting converts to practise their Ancestral Rites and the meaning of the terms *Tien* and *Shangti* were the particular points of disagreement. In Japan, besides the dispute respecting Pope Gregory's Bull, we find the Jesuits accusing the others of indiscreet zeal and being met with the counter-charge of timidity. Doubtless the main current of events in each country would not have been altered if the Jesuits had always remained alone in the field, but it is only fair to them to state that their mode of operations was that best calculated to ensure success.

There is an important distinction in the "Christianities" of China and Japan which should not be left unnoticed. Among the causes which operated in favour of the missionaries were Trade in Japan and Science in China. That the early missionaries in the former country owed their success in a great measure to their connection with commerce we have many proofs, which leave little room for doubt. Charlevoix particularly speaks of the understanding between the missionaries and the Portuguese traders, and in one instance we are told that a Daimiô who had proved hostile to the Christian cause was only permitted to have commercial dealings with the Portuguese ships which then visited Japan, on the condition that he would grant certain concessions on behalf of their religion which the missionaries demanded. Trade and Christianity went hand in hand. It was commerce which was first the means of introducing Christianity; it was the same agent that assisted it in its checquered career; and it was commerce which enabled the Franciscans to establish themselves later on in the N.E. of Japan.

In China things were different. Here there were no independent feudal barons to engage in commercial enterprises on their own account. A large Empire long accustomed to be dependent on its own resources and unwilling to break with its own traditions as long as the administration was in the hands of a conservative bureau-

Digitized by Google

cracy, was not likely to welcome a few missionaries preaching a new and strange doctrine for the sake of trade with foreign countries. Besides, it was not, as in Japan, a case of, no missionaries—no trade. The little foreign trade that did exist had its origin with the establishment of Macao in 1517,—sixty-seven years before the first missionary settled in Canton. Moreover, the earlier efforts of both Nestorians and Catholics had had no connection with trade. It is not to any connection with commerce, then, that we can trace the success which attended the introduction of Christianity in China. Still another agent, no less powerful in its way, was not wanting. Unlike the Japanese, who from never having enjoyed the blessings of peace and good government were still in that state of primitive civilization in which letters do not bear an important part, the Chinese had reached a very high degree of mental culture, and letters were then, as now, the stepping stone to rank and influence, and the *literati* the most powerful and respected class in the country. With the shrewd tact which has marked the Jesuit policy in all ages, the missionaries were not slow to comprehend the situation, and indeed they had the very elements necessary for success in themselves. No small share of the learning and science of the Middle Ages was held by the Jesuit confederacy, and in this respect the individuals chosen to lead the way in China were in no way behind others of their order. We see them, therefore, busily making use of their knowledge of the Chinese language to instruct the natives in arts and sciences in which western nations excelled. Were the Chinese indisposed to listen to the truths of Christianity, they were amused by instructive discourses on mathematics and other branches of learning; did a Chinese audience shew inappreciation of a religious exhortation, forthwith a lecture on some abstruse science was substituted.

In this way the missionaries gained the ear of the Chinese and at the same time established their reputation as men of learning and their claim to be regarded as on a par with the native *literati*. This explains the presence of the

Digitized by Google

missionaries at Court, where Ricci, Schaal and Verbiest successively filled the chair of Astronomer Royal, and is the secret of the favour and protection so long accorded to them by the Chinese Government.

It is interesting to note the nature of the opposition which Christianity encountered in each country. In China this opposition had its origin in three sources, the jealousy of the *literati*, the suspicions of the Government and the animosity of the Buddhist priests. To take the last first, Semedo, Kirchere, and other writers make mention of the hostility displayed by the Buddhist priesthood, so we may suppose that what influence it possessed was exerted against Christianity. But this influence was small. Confucianism and Rationalism, doctrines more suited to the cynical indifference of the Chinese mind, left little elbow-room for Buddhism. As has been well pointed out by a modern writer, with the imposition of the once odious pigtail the yoke of the Tartar ended. Though Buddhist himself he was never able to impose his religion on the multitude of free-thinking Chinese. The Buddhist priests were held in little respect and exercised but slight influence over the minds of the masses. The mainsprings of the opposition which Christianity encountered in China lay in the *literati* and Government. Owing their early success primarily to their rare scientific acquirements, it is only natural that the line of policy thus adopted should have brought the missionaries into contact with the *literati*. It is not difficult to imagine that in the numerous arguments and discussions which must, from the nature of the case, have been carried on between the two, the superiority of the foreign scholars had the effect of exciting universally the jealousy of the former; and that these, chafing at the ascendancy of the missionaries in numerous intellectual attainments in which they had hitherto possessed a monopoly, lost no opportunity of securing their expulsion from the Empire. Hence, whenever popular outcry was raised against the Christians, we find the *literati* at the bottom of the movement; and they

Digitized by Google

were also the authors of the calumnies which were whispered in the ears of the officials against the Christians and their teachers. And the suspicions of the Government were easily roused. For the local officials, becoming alarmed at the reports which reached their ears, or anxious to shew inexpensive zeal for the public service, were never slow to present memorials in which they represented the Christians as members of a secret society which was plotting against the Government. An accusation which the prevalence of such societies at all times in China rendered very plausible. The proofs of it were brought in the shape of lesser charges as follows:—It was said that, "The Christians hold mighty meetings at "their houses at certain stated times, when thousands of "people assemble; that each convert is presented with "five ducats made by a process of alchemy; that they "have arms secreted in their houses; that they are all "instructed to make the sign of the cross upon their fore-"heads in order that this may serve as a mark by which "the adherents of this society may recognize each other "when the time for organizing the insurrection arrives."

Similar charges might have been made with equal justice against the Jews and Mahomedans resident in the country, who kept themselves quite as much apart from the body of the people as the Christians. Probably, however, their passive attitude in regard to their respective creeds furnishes the reason for their being unassailed, while it is no less probable that the religious enthusiasm of the Christian converts, and the quarrels which existed amongst their teachers, increased suspicion in the Chinese mind to which religious fanaticism and sectarian jealousy are alike foreign.

In Japan the opposition was of two kinds, political and religious. The political opposition which Christianity encountered was shewn in the attitude of the Government. The favorable reception accorded to the semi-political, semi-religious embassies to Japan, these missions owed almost entirely to their political importance. The missionaries were never in favour at Court except for a short

Digitized by Google

time under Nobunaga, and when they were not actually molested were persistently ignored.

As regards the religious opposition brought to bear against Christianity, it has already been shewn how powerful was the Buddhist priesthood at the time of the introduction of Christianity, and the Jesuit records leave no room for doubt that the opposition met from it by Christianity was very great. And although the capacity of the Buddhist priests for resisting Christianity openly was greatly lessened by the treatment they received at the hands of Nobunaga, still the weapon of intrigue was always available, and there are many indications that they used it unsparingly.

It may be thought that too much importance has been attached to the influence exercised by the Buddhist priests. It may be said that the solution of the question is that the Jesuits had acquired such a hold upon the country as to embolden them to assert the temporal supremacy of the Pope, and by precept and example to instigate their converts to set at defiance the law of the land; that the Government suddenly awoke to the fact that a large portion of their subjects were passing from their control, and that their suspicions being roused, the advent of the Dutch and the information they gave respecting the aims and objects of the Papacy, turned the scale against the missionaries. The sweeping measure of expulsion affecting all foreigners alike is pointed to by the holders of these views as a proof of its correctness; the severity of the persecution when once commenced is attributed by them to the effect of panic on the part of the ruling powers; and they explain the fact of greater leniency being shewn to the missionaries and converts in China by assuming that the missionaries in the larger field of operations never obtained a sufficiently firm foothold to justify them in making a similar claim for Papal supremacy.

This view, however, plausible it may appear, is not borne out by facts.

Apart from the circumstance that there is no evidence to prove that the missionaries ever went so far as to as-

Digitized by Google

sert the temporal supremacy of the Pope, the Japanese records are unanimous in the testimony which they give respecting the attitude towards Christianity of the three great men, whose successive administrations embrace the period of Christianity in Japan. And this evidence shews how Nobunaga, though at first favourable to Christianity, later on repented of his sanction to its introduction, and how both Hideyoshi and Iyeyasu were opposed to it from the outset of their administrations. Christianity was, it is clear, tolerated for political motives. It owed its rapid progress to the unsettled state of the country. The powerful nobles of the South paying but a nominal allegiance to the Court, availed themselves of their practical independence to introduce Christianity for the sake of the commercial advantages which it offered. Nobunaga never felt himself strong enough to prohibit it; Hideyoshi, whose military ambition left him little time for anything but warlike expeditions, was probably deterred from the adoption of extreme measures by similar reasons; and it was thus left for Iyeyasu, who had the advantage of succeeding the other two, to carry out the policy in which it is clear that they all concurred.

It is thus apparent that the measure of 1614 was not the effect of any sudden disclosure respecting the power and aims of the Jesuits. It was but a continuance of the policy previously inaugurated by Hideyoshi in 1587.

There is nothing whatever, also, to discountenance the view that the Buddhist priesthood actively participated in the expulsion of the missionaries. Amongst other evidence we have a document written by a priest in the very year (1614) in which the edict of expulsion was carried into effect, which descants in severe terms upon the evils likely to arise from the teaching of the foreign missionaries, "Who have," it says, "come to Japan, "*not* in order to promulgate their religion, but with a "view to possess themselves of the country. Japan has "two state religions and has no need of a third; there-"fore this new religion should be stamped out.

Digitized by Google

The leading characteristics of both nations have left their impress upon the history of Christianity in each country.

The Chinese, naturally bigoted, impassive, and slow to grasp a new idea which is unattended with any practical association, viewed the new doctrine taught by the Roman Catholic missionaries with disfavour for a long time, and it was only by long and patient endeavours that converts were made. These once made, however, they exhibited the same tenacity in adhering to their new faith that had marked its previous rejection by them. This explains at once the show progress made by Christianity in China and the fact of its vitality long after it had been trodden out in Japan.

The Japanese, though a long seclusion from the outside world has imparted a narrow-mindedness to their character, are not so fettered by tradition as the Chinese, and unlike the latter they are impulsive and singularly quick to receive new impressions. They lack, however, the solidity of character and reasoning capacity of the average Chinese. The doctrine taught by the foreign missionaries had for them the charm of novelty and they accepted it eagerly. But it is very doubtful if they ever approached the Chinese as regards the intelligent appreciation by the latter of the fundamental tenets of Christianity. The latter had attained a higher degree of mental culture, and are to this day a more thoughtful and practical race than the Japanese.

The Jesuits in China mention that the great mass of their converts belonged to the middle class, whilst it is clear that in Japan the converts were mostly taken from the peasantry. One reason for this difference is probably to be found in the fact that in China the prosperous state of the country under the Ming dynasty, by favouring the growth of trade, had enabled the middle classes to secure a position which in Japan they were unable to do owing partly to the unsettled condition of the Empire.

Digitized by Google

In other words, in China there was a prosperous middle class; in Japan this class had yet to make its appearance. If may be also that the policy which induced the missionaries in China, to assume the dress of the *literati* had the effect of bringing them into contact with the more educated portion of the nation. In Japan, too, that curious division of classes and their respective positions in the social scale which existed until comparatively recent times, and by which the farmer, or peasant, was placed above the merchant and artizan, had possibly some influence in guiding the missionaries in their choice of converts. At least it may safely be said that the lower classes were thus brought into prominence, a fact which would probably not escape the notice of the propagators of Christianity.

But perhaps, after all, the greatest difference between the Christianities of China and Japan is to be found in the nature and extent of the persecution to which each was subjected. It has already been pointed out that the religious feeling was at a low ebb in China, and it has been shewn how the opposition encountered by Christianity in that country originated in the jealousy of the native *Literati*, and was fostered by the suspicions of the Government. As a natural consequence it followed that the persecution in China was secular and official in its nature, and political in its object. It has also been shewn how in Japan there is every reason to suspect the connection of Buddhist intrigue with the opposition given to Christianity, and this conclusion is confirmed by the features of the persecution in the latter country. The fierceness and virulence with which it was conducted contrast strongly with the mildness of the prosecution in China, and can only be explained on the assumption that it was to a great extent religious in its nature.

In China the prosecution began with the first introduction of Christianity, and continued with more or less severity up to modern times. It was never, however, very fierce. One explanation of this suggests itself. Toleration of creeds has always been a national trait, and thus

Digitized by Google

the adherents of all creeds have invariably found an asylum in China. Whether Confucianists, Buddhists, Mahomedans, or Jews, so long as those following these various religious systems remained good citizens and refrained from interference with their neighbours, they were permitted free exercise of their respective religions. The conduct of the Christians, although they possibly did not maintain an altogether passive attitude in regard to religion, was probably not marked by that fanatical zeal displayed by their co-religionists in Japan. Whether this be one of the reasons or not, certain it is that the persecution in China never attained any great degree of severity. Semedo and other writers speak of the native converts being arraigned before tribunals, of their suffering lengthened imprisonment with forfeiture of houses and property and being cruelly bastinadoed; but they generally escaped with their lives, and if condemned to exile found a refuge in other provinces where they were secure from the persecution which threatened them in their native districts. And this also applies to the foreign missionaries. A few isolated instances of missionaries having suffered death are all we find during a course of nearly 300 years.

When we turn to Japan the contrast is startling. The persecution here was widely different both in nature and extent. It is unnecessary to touch on the persecutions before 1614. As has already been pointed out, with the exception of the persecution in 1588 in which nine missionaries lost their lives, these were merely local, and even in some instances were provoked by the mistaken zeal of the converts, who, not content to let well alone, endeavoured to force their own convictions upon unsympathising neighbours.

Persecution in Japan did not break out in its fullest extent until after the edict of 1614. Then it burst upon the heads of the devoted Christians with all the fury of a pent-up flood, carrying all before it. Japanese records, hitherto almost silent on the subject of Christianity, supply us with abundant details concerning the persecution then instituted.

Digitized by Google

A special service, it appears, was organised which was called the Christian enquiry, and the men entrusted with its superintendence were chosen from among the leading nobility. Notifications urging the adoption of the strictest measures followed each other in rapid succession, and a system of rules for the regulation of this "enquiry" was drawn up, in which the minutest details regarding the search after Christians and missionaries, their arrest, imprisonment, examination and punishment, were carefully entered into. Government officials in the oaths which they took when accepting office, bound themselves amongst other duties to render every assistance to the "Christian Enquiry"; and a scale of rewards for the apprehension of Christian missionaries, and those who harboured them, was prepared and published, these rewards being increased as the decreasing number of both converts and teachers rendered the search after them more difficult. Nor were the ties of family and kindred respected. High inducements, reaching to the extent of pardon if the informers were Christians, were held out to parents to inform against their children, and to husbands to denounce their wives. In short, while the persecution lasted, the crime of harbouring a Christian, or of being cognisant of the existence of a Christian and not denouncing him, was only surpassed in enormity by the more heinous offence of being a Christian.

The description of the tortures to which the Christians were subjected reads like a page of Dante's Inferno. The mode of death seems in many cases to have been left to the whim and caprice, if not of the executioners, of those who superintended the executions, and though a great number perished by the ordinary modes of execution, such as hanging, crucifixion, strangling, and drowning, in several instances the most ingenious tortures that cruelty could invent were put into practice.

We read of Christians being executed in a barbarous manner in sight of each other, of their being hurled from the tops of precipices, of their being buried alive, of their being torn asunder by oxen, of their being tied up in rice-bags, which were heaped up together and of the pile thus

Digitized by Google

formed being set on fire. Others were tortured before death by insertion of sharp spikes under the nails of their hands and feet, while some poor wretches by a refinement of horrid cruelty were shut up in cages and there left to starve with food before their eyes. Let it not be supposed that we have drawn on the Jesuit accounts solely for this information. An examination of the Japanese records will shew that the case is not overstated.

Who can wonder, in the face of these facts, at the Shimabara insurrection? The only matter for surprise is that many similar outbreaks did not occur. Had the Christians been united, such atrocities could not have failed to rouse a spirit of resistance culminating in open rebellion, which, if successful, would have shewn scant mercy to the oppressors. But the scattered state of Christian communities made united action impossible, and thus with the exception of a few obscure hints at disaffection and local troubles which are met with in Japanese books, the Shimabara Revolt remains the solitary instance of the Christians having risen against their persecutors.

While on this subject it may be well to state that there are two very different accounts of this revolt which are given in the "Shimabara Kassenki" and the "Samedaresho." In the first, the leaders of the revolt, mentioned as five in number, are described as being former retainers of the Christian convert Konishi Setsu-no-kami; in the latter the outbreak is stated to have been fostered by the intrigues of one man, an adventurer, and great stress is laid upon the fact that the discontent which preceded the revolt was mainly caused by the bad government of the reigning Prince (who was afterwards deposed). In any case, in computing the extent of the rising, one must allow for the exaggeration common to all writers of early history, and the number of the insurgents, given at 30,000 is reasonably open to doubt.

It only remains to consider one feature which is common to the history of Christianity in both China and Japan. We allude to the small moral and intellectual influence which the practice of Christianity has exercised in either

Digitized by Google

country. The early Christian missions, when they were swept away by the tide of Tartar invasion, left no traces behind them of any permanent influence upon the minds of the Chinese nation. Nor were the later introductions of Christianity which are the subject of this paper more successful. In Japan it was the same. Thus, under different conditions, the same result was reached in each country.

In the violence of the persecution to which Christianity was subjected in the latter country, joined to the social status of the majority of the converts, and the important circumstance that the crusade against the missionaries began just when the period of Japan's greatest internal prosperity had commenced, we find the main causes of this failure.

In China, on the other hand, it is unnecessary to look further than the national character. The Chinese as emigrants in whatever part of the globe present the striking picture of small communities on foreign soil living entirely apart from the people of the country. Neither the language, nor the religion, nor the habits of the nation among which they dwell have the slightest effect upon them. They leave in each case, as they came, Chinese in every respect. And if this insensibility to foreign influences be manifested when surrounded by all the accessories of foreign civilization, how much harder the task of affecting their native stoicism in their own land, amidst a population of three hundred millions wedded to its conservative notions by the fetters of ancient tradition.

It will occur to most readers of the preceding pages that the present efforts in the cause of Christianity are made under many favourable conditions. It will be seen that Christianity now stands distinctly on its own merits; that though unaided by any powerful political supporters, it no longer has to fear opposition from the Government arising from suspicion of foreign designs of territorial acquisition; that it is no longer exposed to the terrors of a persecution which the feeling of the age has

Digitized by Google

ceased to sanction; and that its true aims will be brought out more clearly by its disseverance from politics and trade.

Also may it be observed that increasing intercourse with foreign nations, for which greater facilities are daily afforded, must at length break down the barriers raised by ignorance and distrust; and that as the education of the young is a better weapon with which to meet the indifferentism of the upper classes, so prevalent in each country, than the conversion of the adult population, the establishment of schools, and medical missions, and the gradual diffusion of knowledge in these and other ways, are the surest roads to success.

Digitized by Google

ASIATIC SOCIETY OF JAPAN.

A general meeting of the Society was held in the Tôkiô Daigaku on Saturday, 27th October, Dr. Murray, Vice-President, in the chair.

The minutes of the Annual Meeting held in Tôkiô, on the 27th June, and those of the meeting held in Yokohama, 13th October, were taken as read.

In the absence of the Treasurer, the Recording Secretary read the report on the financial condition of the Society.

Treasurer's Report.

In the Annual Report for this year the balance to the credit of the Society is given as $342.33. At the time of the presentation of the report it was considered that nearly all the subscriptions that were forthcoming had been collected; but I expressed a hope—a hope, however, which I am afraid was regarded as rather visionary at the time—that a considerable sum could in addition be collected. I am now happy to state that I have been able to add $264.82 to the balance, making with some $15 that I am daily expecting, a total sum of over $633. All the subscriptions for this year that it is possible to obtain have, I think, now been collected; as well as some for 1876 and 1875 that I have been able to gather in.

The expenditure since the Annual Meeting has been $147.40, the principal items being for printing notices during the preceding twelve months, for lithographs and the purchase of Mr. Brunton's map for the Society's Library. Some $510 are now due for expenses incurred in the publication of the current number of the transactions and of Mr. Longford's paper, on payment of which the cash balance would show a small deficit of some $20. On the other hand, some twenty copies of the Transactions for this year have already been sold, so that this deficit is reduced to practically nought. Now there exist over 950 copies of the Transactions not due to Members and therefore available for sale, and judging from the announcement made by the Council in the last report that nearly all the copies of Volume II and Volume III, Part I, had already been sold, and that they would therefore be willing to buy back copies of these numbers so as to be able to make up complete sets, we may fairly expect that all the 950 copies will eventually be disposed of; so that the funds of the Society cannot

Digitized by Google

be said to be at all at a low ebb, although there is no cash balance. Of the 950 mentioned above over 300 are already in the hands of our Agents in London, New York, Shanghai, and Yokohama, and 136 more have just left Japan, and I am sorry that the non-receipt of the accounts of the sales prevents my entering these sums in the cash account.

Compared with last year the funds may be considered to be in quite a flourishing state, first because our stock of Transactions for sale is considerably increased by the current numbers, secondly because we are not in debt as we were this time last year, although the cost of publishing during this year Volume V. Part 1 and Volume V. Part 2 has been nearly double the amount spent in any previous session for publication.

W. E. AYRTON,
Treasurer.

At the last Council Meeting it was resolved to recommend to the next General Meeting that an Entrance Fee of $5 be imposed upon future members. Prof. R. H. Smith read the following report of the Committee appointed to confer with the Council on the above subject.

REPORT OF COMMITTEE.

The Committee appointed at the Meeting of the Asiatic Society held on the 13th instant to confer with the Council of the Society as to the desirability of charging an Entrance Fee to new members, have the honour to report that the following members of the Committee, Mr. Robert H. Smith, Mr. W. G. Dixon and Mr. H. S. Wilkinson, attended by invitation a meeting of the Council held at the British Legation on the 20th instant, and, having conferred with the Council upon the subject referred to them, unanimously resolved to recommend to the Society the adoption of a rule charging to new members an Entrance Fee of Five Dollars.

H. S. WILKINSON.
ROBERT H. SMITH.
WILLIAM GRAY DIXON.

23rd October, 1877.

The question was then put by the Chairman and unanimously carried.

Professor W. E. Ayrton then proposed in writing an amendment to Rule 5, having previously given notice to the Council, that in Rule 5, for the words "previous to the latter half of the year," the words "during the first nine months of the year," be substituted.

Digitized by Google

In accordance with the rule relating to such questions, Dr. Syle proposed, and Mr. Satow seconded, the appointment of Messrs. McClatchie, Dodds and Parson, as a Committee to confer with the Council on the subject. This was put by the Chairman and carried unanimously.

The election of the following gentlemen as new members was then announced :—Professor D. Kikuchi, Mr. T. W. Hellyer, Rev. C. T. Blanchet, Professor F. F. Jewett, Mr. Peyton Jaudon.

The Library Committee announced the receipt of the following books and periodicals :—

The Bhagavad Sita; Translation.
Russia in Asia. (In Russian)
Waifs and Strays from the Far East.
Journey through the Caucasus and the Interior of Persia.
Brunton's Map of Japan.
Bulletin de Géographie.
Bulletin d' Acclimatation.
Celestial Empire.
China Review.
Proceedings of the Royal Geographical Society.
Boletin de la Societa Geográfica de Madrid.
Monatsschrift für den Orient.
Proceedings of the Royal Asiatic Society.—North China Branch. Parts X and XI.

Dr. Faulds in presenting a branch of a tree said: The branch which I now lay before the Society was on a tree in my own garden. It is studded with small, somewhat cowry shaped whitish waxy bodies, tinted delicately with pink, and reminding one of the ice ornaments which are fixed on the edges of bride's cakes. They are sometimes found singly, and at other times grouped, the larger ones being often squeezed tightly together as if by their gradual enlargement. They present indentations in which the pink hue is more marked. In all of them there is a well marked hook-like portion composed of the same whitish material. This does not enlarge apparently, but is of the same size in the smallest ones as in the largest. On the surface attached to the wood there are generally four white lines, sometimes more, bending over from the outer surface and tending to converge to the centre of the attached portion. When the substance is removed, traces of these white lines are left on the wood. The attached surface shews a brownish red central, oval portion, with delicate raised bands

Digitized by Google

of the same colour, like the belly of certain aphides. The waxy material can be removed and leaves an oval brownish-red, cyst-like body, with a minute dark coloured stem shaped like a beak, containing a yellowish glairy fluid with faint streaks of dull red. The white covering contains much water, which leaves a pinkish waxy substance on evaporation. This dissolves completely in turpentine, and forms a semi-transparent glycerine-like substance with caustic potash. The wall of the capsule is tough, but crisp to the feel, loses its brown colour and assumes a faint lemon yellow but transparent appearance with acetic acid. It shows with ¼ inch microscopic power a series of parallel rows of papules which contain pores, from which the white waxy envelope seems to exude. From near some of these spring hairs. These elevated pores partly retain their colouring even with acetic acid. The contents are cells of all sizes, round or oval in shape, from which fact they do not seem to have been subjected to any pressure.

The largest of them by micrometric measurement are $\frac{1}{170}$ of a millimetre in diameter, but by far the greatest proportion are not larger than bacteria. These smallest ones are for the most part grouped together. Between the largest cells are groups of minute red coloured ones, forming in their arrangement a net-like appearance, and in some parts these seem to be contained in delicate transparent vessels of irregular calibre.

My own conclusion is that the organism is the undeveloped female of an aphis of which I have as yet been unable to find any description. In Van Beneden's quite recent work on animal parasities it is not mentioned. It has resemblances to the woolly aphis or American blight (A. lanigera; Eriosoma mali of Leach), from the pores of which exude a 'cotton-like wool' or cottony excretion. I have not seen the male, but believe it has been seen in Tôkiô. When found it will of course be winged.

The corresponding Secretary then announced the receipt of "An analysis of certain articles of Japanese food" by Mr. B. W. Dwars which on his motion was taken as read, and recommended to be printed.

"A Review of the Introduction of Christianity in China and Japan" by Mr. J. H. Gubbins, was then read by the Secretary.

Professor Syle said that he would only add a few facts by way of supplement to the information contained in the paper. Père Verbiest had been required to superintend the casting of

Digitized by Google

cannon; and it was laid upon the Roman Catholic Missionaries to make a trigonometrical survey of the Empire, which they did. Mathew Ricci was eminent for his ability and success: it was claimed that, at his death, he left between 300 and 400 organized Churches in China. About 30 years ago might be seen at Shanghai, the raised terrace, surrounded by a handsome stone balustrade, which had been constructed for the purpose of making his astronomical observations. To assist in his mathematical calculations he took a promising youth from the Zie family and instructed him, leaving behind a mathematical book which is found in use at the present day. Young Zie was instructed in religion also, and became a zealous convert, composing an Apology for Christianity, which has been compared with that of Justin Martyr. He rose to the highest rank as a Mandarin, being made finally a *Tsen-Siang*, or Prime Minister. He retired in his old age to Shanghai, where his own influence, and that of his grand-daughter Candida, was such as to increase the number of converts; and permanency was given to the effect of their labours by the gift of their homestead to the missionaries. On that property has been built an extensive ecclesiastical establishment, now known as the *Ze-ka-wei*, where the meteorological observations were made which are found in the last volume of the Shanghai Asiatic Society. Prof. Syle also remarked that, in regard to the absence of any permanent impression made by the efforts of the Roman Catholic Missionaries, it was to be observed that there were many benevolent institutions in Kiang-Nan, the Province in which are situated Shanghai, Sung-Kiang and Soochow; and no inquiries, continued through a number of years, had enabled him to trace their origin back farther than 200 years. There are Foundling Hospitals, Dispensaries, Poor-houses, Strangers' Homes, Funds for Bridge-building, Burials, Widows' Pensions, Life-saving, Fire extinction, etc., etc., and the Roman Catholics claim that these all arose in imitation of the Orphan Asylums, etc., which they had been the first to establish —a claim which there is nothing to discredit, as far as now known.

Mr. Satow then made the following observations upon the causes which led to the downfall of the Christian Mission in Japan:—

Persecution and opposition of various kinds had characterized the progress of the Jesuit missions almost from the very commencement. The fathers were frequently unfortunate

Digitized by Google

enough to have been patronized in the first place by chieftains who afterwards succumbed to powerful enemies, such for instance as Suye Harukata at Yamaguchi, the Ohotomo family in Bungo, the sons of Nobunaga and Hideyoshi. We may also suppose that the favours which had been shown to them by Nobunaga himself were no reason why Hideyoshi should take their part after Nobunaga's assassination. Nevertheless, as the Jesuit missionaries conducted themselves with great tact, it is by no means improbable that they might have continued to make converts year by year until the great part of the nation had been brought over to the Catholic religion, had it not been for the rivalry of the missionaries of other orders. To the natural rivalry of teachers of a different school we must add the effects of the international enmity which existed between the Portuguese of Macao and the Spaniards of Manila, and when the Dutch and English came upon the scene they in their turn endeavoured to excite the suspicions of the Japanese rulers against their hereditary foes the Spaniards. We have evidence of this from European annalists. The following well-supported story of English and Dutch treachery is from a Japanese source.

"In the year 1617 (third of Genna) a Dutch vessel fell in at sea "with a ship of Chinese build, and observed on board several in- "dividuals who appeared to them to be Bateren.[1] As the Dutch "used at that time to trade to Hirado, they brought the ship in "there, and reported the matter to Matsura Iki no kami, who sent "information to the Governor's office at Nagasaki. Hasegawa "Gonroku was at once despatched to Hirado, to conduct an in- "quiry into the facts of the case, from which it appeared that the "ship belonged to a native of Sakai in Idzumi, named Jōjin, and "that she had been on a trading voyage to Lugon. Several letters "written in barbarian character were discovered on board, which "were handed to the Hirado interpreter Mori Sukeyemon to be "translated. They were found to be addressed from barbarous "countries to Bateren who were lying concealed in Japan, and "their purport was to the effect that as soon as the greater half of "the Japanese nation had been converted to the Kirishitan Sect, "information should at once be sent to the writers, upon which a "large fleet of war-vessels should be despatched. In consequence "of these facts the Bateren who had been found in the ship and "Jōjin were taken prisoners to Nagasaki, and there burnt, the "remainder of the crew being decapitated. Rewards for their "fidelity were given to the Hollanders on this occasion."[2]

The capture here spoken of is no doubt that of the fathers Luis Flores and Pedro de Zuniga by an English vessel the *Elizabeth* in 1620 off the coast of Formosa. The vessel,

1. Priest: a corruption of the Portuguese Padre.
2. Hekija Kuwanken-roku, I., p. 20, v.

Digitized by Google

crew and Jesuits were transferred by the captain of the *Elizabeth* to the Dutch, who brought them in to Hirado. Jôjin is probable Joaquim, a converted Japanese, captain of the junk. It would be absurd to believe that the letters which are said to have contained information about treacherous designs on the part of the Spaniards of Manila were genuine. We know that both the English and the Dutch in those days did all in their power to prejudice the rulers of Japan against the Portuguese and Spaniards, whether missionaries or merchants, and even two centuries ago the Dutch were accused of forging a letter, which purported to be written by the Portuguese Bishop in Nagasaki to the Viceroy at Goa, and from which it appeared that the Spaniards and Portuguese had formed the design, not only of converting the Japanese to Christianity, but under the cloak of religion, of bringing the whole country under their rule; and this letter, having first concealed it on board a Portuguese vessel bound for Goa, they caused to be discovered by the Japanese authorities. This story may be read in Mercklein's appendix to Caron's Japan, and Arnold's annotations thereto, p.p. 285 and 286, and to the discovery of the letter is attributed by Montanus those measures of the Shôgun which provoked the insurrection of Shimabara, which drew in its train the expulsion of the Portuguese from Japan in 1639.[3]

Another cause which must have contributed no little to the difficulties of the missionaries was the hostility of renegade Christians towards the religion which they had abandoned. Montanus gives a specimen of this in the language addressed by the apostate Syovan to the Jesuits Pedro Marquez and his companions in the presence of the Dutchman Schaep,[4] and other cases may easily be found in the pages of European writers. In the *Kuwanken-roku* already cited is the following story of an ecclesiastic (apparently of Japanese birth) who turned informer:—

"In the year 1611 (16th of Keichô) a priest arrived at Sumpu "from Yatsushiro in Higo, and prayed leave to bring an accusa- "tion. He said that he was a priest of a Kirishitan temple which "had been built by Konishi Settsu no kami, formerly lord of the "province of Higo. That the superior of the temple had made "unjustifiable accusations against him, and expelled him from the "said temple. That if His Highness would summon the other "priest to appear and deign to examine into the rights of the

3. See also Pagès, Hist. de la Religion Chrétienne au Japon, vol. I, p. 450.
4. Montanus, English edit. 1670, p. 358.

Digitized by Google

"matter, in token of loyalty, he would give an account of the "objects of the Kirishitan sect. His opponent the other priest, "was summoned to Sumpu, and the case was thoroughly investigat- "ed. The opponent, being adjudged to be in the wrong, was "punished. The other priest, out of gratitude for the benefit he "had received, gave the following account of the principles of "Kirishitan:—'The King of Namban[5] devoted the revenue of "'the five countries which composed his dominions to the follow- "'ing objects. Every year, under the name of merchant-vessels, "'ships were sent to Japan laden with gold, silver, precious "'gems, woven fabrics, and articles of *vertu*, for the purpose of "'recommending to everybody the evil religion. The Bateren and "'Iruman[6] annually prepared a record, in which was inserted "'the number of persons who had been induced to join the re- "'ligion in that year, and the valuable goods were distri- "'buted among them in proportion. From ancient times the "'Namban men, in this cunning way, had been wont to send val- "'uable and curious commodities to Luçon, Hisupaniya[7] and "'other countries in the Southern Seas, where at first they "'obtained the loan of a very small piece of ground, on which "'they then built a temple, and began secretly to teach Kirishi- "'tan. The ignorant inhabitants of those countries believed in "'their doctrines, and finally becoming allies and partisans of the "'Namban men, enabled the latter to take possession of the land "'without any trouble. The Barbarians then proceeded to send "'governors to the countries which they had seized, took pos- "'session of the land, its valuable produce, and of all the gold "'and silver as their own property, and every three years sent "'these treasures to their own country.' Furthermore, a number "of priests who were lying concealed in the Home Provinces and "in Kiushiu were summoned to Sumpu, and subjected to a search- "ing examination, from which the statements of this priest clearly "appeared to be true. Upon this a decree was published strictly "interdicting Kirishitan throughout the Empire. Itakura Iga "no kami was appointed to hold trials in the Home Provinces, "and Yamazaki Nagato no kami in the island of Kiushiu; and all "the persons of the evil sect who were discovered in Kiôto, Ôsaka, "Nara, Fushimi and other towns were decapitated on the dry bed "of the river at Gojô.[8] Those of them who, changing their evil "hearts, were converted to right principles, and petitioned for "leave to adopt a new belief, were spared under the designation "of *korobi* (fallers)."

[*Kuwanken-roku*, Vol. I., p. 18.]

This account is confirmed partly by the reports of the missionaries in their annual letters. The proclamation referred to is as follows:—

PROCLAMATION OF IYEYASU.

The Positive Principle is the father, the Negative Principle the mother by whom man is begotten, and with his birth the Three Powers are complete.

---

5. Portugal and Spain being under one crown at this period, Namban means the whole of the Iberian peninsula and its dependencies.
6. Brothers, a corruption of the Portuguese Irmao.
7. New Spain is probably meant.
8. Gojô no kawara, part of the stony bed of the Kamo-gawa, which flows between the old capital and its eastern suburbs.

Digitized by Google

Japan from the commencement was the country of the gods. The unfathomableness of the Positive and Negative Principles is called god, and who shall refuse reverence and honour to the essence of all that is Holy and Spiritual. Man owes his existence entirely to the workings of the Positive and Negative, in his five members and in the six sources of perception, in his uprising and sitting down, in moving and in being still, he is not independent of god for a single moment. The divinity is sought for elsewhere; everywhere man is provided with a divinity, and contains a complete divinity within himself. This is the form which divinity takes.

Japan is called the land of Buddha, and not without reason. It is written: "This is the country where the divine brightness re-"appears, this is the native-land of the Sun." The Lotus of the Law says: "The power by which Buddhas save the world, resides in their perfect omniscience, whereby they make happy all living beings, wherefore they make manifest immeasurable divine power." This is a golden saying, a miraculous passage. God and Buddha differ in name, but their meaning is one, just as if the two halves of a tally be placed together. The priests and laymen of antiquity, by the divine aid, sailed over the ocean and visited the far-off land of China in search of the law of Buddha, and the doctrines of the principles of benevolence; unwearyingly they bore hither the esoteric[9] and exoteric books. Since that time the doctrine has been handed down from teacher to teacher in unbroken succession, and the glory of the Buddhist Law has been far greater than in other lands. This exemplifies the truth that "the Law of Buddha gradually travels eastwards."

But the Kirishitan band have come to Japan, not only sending their merchant vessels to exchange commodities, but also longing to disseminate an evil law, to overthrow right doctrine, so that they may change the government of the country, and obtain possession of the land. This is the germ of great disaster, and must be crushed.

Japan is the country of gods and of Buddha; it honours god and reveres Buddha. The principles of benevolence and right-doing are held to be of prime importance, and the law of good and evil is so ascertained that if there be any offenders, they are liable according to the gravity of their crime to the five punishments of branding, nose-slitting, cutting off the feet, castration and death. In the Book of Etiquette it is said: "The degrees of mourning are many, and the appropriate dresses are five. Crimes are many, and the appropriate punishments are five." If there be one suspected of crime, let the gods bear witness. By oath shall be determined the offence and its punishment, and the distinction between guilty and innocent shall not err by a hair's breadth. Criminals of every degree are detested by Buddha, god, the trinity of precious ones, mankind, Heaven and all living things. The overflowings of accumulated wickedness shall not escape; whether by crucifixion or burning in the furnace, punishment shall be meted out, for this is the way of encouraging the good and chastising the evil. Though one may desire to keep down evil, it accumulates with ease; though one desire to advance in good, it is difficult to hold

9. The Buddhists affect to make this distinction between their scriptures and the writings of the philosophers.

10. Triratna, *i.e.* Buddha, the Law and the Priesthood. See Eitel's Handbook of China, Buddhism, s.v.

Digitized by Google

by; and thus a watch must be kept. In the present life it is so, and in the next not even all the Buddhas past, present and to come, can save from the reproaches of the King of Hell, nor can the successive generations of our ancestors succour us. Fear and tremble!

The faction of the Bateren rebel against this dispensation; they disbelieve in the way of the gods, and blaspheme the true Law, violate right-doing and injure the good. If they see a condemned fellow, they run to him with joy, bow to him and do him reverence. This they say is the essence of their belief. If this is not an evil Law, what is it? They truly are the enemies of the gods and of Buddha. If this be not speedily prohibited, the safety of the state will assuredly be hereafter imperilled; and if those who are charged with ordering its affairs do not put a stop to the evil, they will expose themselves to Heaven's rebuke.

These must be instantly swept out, so that not an inch of soil remains to them in Japan on which to plant their feet, and if they refuse to obey this command they shall suffer the penalty. We have been blessed by the commission of Heaven to be lord in Japan, and we have wielded power over this realm for years past. Abroad we have manifested the perfection of the Five Cardinal Virtues, while at home we have returned to the doctrine of the scriptures. For these reasons the country prospers, the people enjoy peace. The Scripture says: "If the present life be peaceful and tranquil, there will be a good place in that to come." Kung-fu-tze also has said: "Body, hair and skin we have received "from our father and mother; not to injure them is the begin-"ning of filial piety." To preserve one's body is to revere god. Quickly cast out the evil Law, and spread our true Law more and more; for the way of the gods and the Law of Buddha to prosper in spite of the degeneracy of these latter days is a mark of a good ruler. Let Heaven and the Four Seas hear this and obey.

This edict was published on the 27th January, 1614, (in the 12th month of the 18th year of Keichô) and was accompanied by a set of fifteen rules intended to guide the priests who were to guarantee the orthodoxy of their parishioners.

1.

Because the Kirishitan law teaches that those who despise death can pass through fire without being burnt, or be plunged into water without being drowned, and that those who die by shedding their own blood are saved, the law of the Empire is most strict. Therefore you must examine such as make light of death.

2.

To those who follow Kirishitan a daily allowance of seven *rin* is made from Dattan (?) land, in order to convert the Empire to Kirishitan. It is an evil Law which injures the country of the gods. As the persons who follow these doctrines do not observe the Law of Sâkya, they object to paying contributions to their parish temple, and dislike the establishment of the Buddhist Law. Such you must examine.

3.

Such chief parishioners as do not attend on the anniversary of the founder of their sect, on Buddha's death-day, at Bon, Higan, the death-day of their ancestors, must lose their certificates, and notice be given to the Office of Sects. They must certainly be examined.

Digitized by Google

4.

Persons who belong to the Kirishitan or to the *Fujiu-fuze* refuse the priest's visit on the anniversary of their ancestors. On that day they are in the habit of paying an informal visit to the temple of their sect, and then secretly assembling their family of laymen; when the priest arrives they look displeased, and refuse his aid. You must therefore examine them.

5.

You must understand that by *Fujiu-fuze* are meant such as do not pay their parish-contribution, and following their own devices, refuse the offices of the chief priest who certifies to the fact of belonging to the sect, do not share in the expenses of the temple of their sect in due proportion to their substance, and in their hearts cherish an evil law.

6.

The Law of *Fujiu-fuze* is that its followers refuse to accept anything said to them by the temple of their sect, refuse to contribute to the expenses of the founder of the sect, to the repair of images and the temple charges generally, nor will they have anything to do with another sect. This is an evil Law. The true law is that human beings who receive the benefits of Heaven should give to Earth; that those who have received benefits from their parents should give to their children, and that those who received from Buddha should give to the priests. Therefore you will examine them.

7

Kirishitan, the Hiden-sect[11] and the *Fujiu-fuze* are three branches of one sect. The god whom they adore is called Godzu-Kirishitan-Teidzu-butsu; and Teidzu calls himself Daiusu (? Deus). By the help of this god, if they look in a mirror, they see the face of a god, but if they have changed their religion they appear as dogs. This is a mirror of the evil law. Those who once look at it believe profoundly in Godzu-Kirishitan-Teidzu-butsu, and regard Japan as a land of demons. But as it is the country of the gods, which tries sects, they appear to keep to the temple of their [Buddhist] sect, mix with other people, and in their hearts they neither receive nor give (*Fujiu-fuze*), and have no connection with the temple of their [Buddhist] sect. These must therefore be examined.

8.

Although the parents for generations past may have belonged without the slightest doubt to one of the eight or nine [Buddhist] sects, it is impossible to be sure that the children may not have in their hearts been persuaded to join the evil law. The temple of the [Buddhist] sect to which they belong must examine them.

9.

The Law of Buddha must be promoted by preaching and expounding, and people be made to visit the temples; they must be induced to perform their duty in the way of contributing to the parish expenses, for the temple services, repairs and building. Those who belong to an evil law or an evil sect, do nothing for the

11. Is *Hiden* a corruption of the word Heathen? We may easily account for its use by supposing Will Adams to have taught the Japanese to apply it to the Roman Catholic faith.

Digitized by Google

temple. They associate but little with others, and in their secret hearts break the law of Buddha, disregarding the exhortations of the priests. Wherefore examination must be made.

10.

After death the corpse's head is shaved and a posthumous name conferred. The chief priest of the [Buddhist] sect must inspect the corpse, and after ascertaining that it did not belong to the evil sect, pronounce the benediction. Examination must be carefully made.

11.

Particular care must be taken to investigate any case in which a person passes over the temple of his own sect, asks a priest of some other temple to perform the funeral rites, and sends away the chief priest of his own temple. Examination must be carefully made for the evil sects, and the evil law.

12.

To every person in the Empire who clearly follows the true law a sect-certificate, authenticated by a seal, shall be given. *Samurai* shall put their seal in the certificate registry of the temple to which they belong. Those who cannot make a seal with blood shall send in a certificate attested by a guarantee.

13.

It is strictly forbidden to transfer the obsequies of ancestors to another temple, and have services performed there. But this does not apply in cases where the death has taken place in a different town or province [from the residence of the successor]. The family altars, the images and painted Buddhas and offerings must be carefully looked to. And every year, when the priest makes his rounds at Bon time, he must examine the family altars of those who belong to his sect.

14.

When a person dies, the directions of the sect-temple must be followed in everything.

15.

The enemies of the Empire and the object of the people's hostility are Kirishitan, *Fujiu-fuze* and the Hiden-sect. When any relatives of a Bateren die, information must be given to the Ecclesiastical office, who will order an inquest, and the priest of the sect to which the deceased has belonged shall conduct the funeral. If the funeral is celebrated before notice is given to the office, the priest will be held responsible. Careful inquiry must be made. The parish priest must on no account unreasonably demand a greater contribution that is suited to his parishioner's means. The true law is that men shall honour Buddha's law and the law of the sovereign with perfect faith. If a single one of these fifteen articles be disobeyed, the culprit shall be subject to divine punishment from Bonten Taishaku,[12] the Four Great Heavenly Kings,[13]

---

12. Brahmâ Sâkra, See Eitel s.v.

13. *Jikokuten* (持國天, see Eitel under Dhrita râchtra), *Zôchôten* (增長天, ib. Virûdhaka), *Kômokuten* (廣目天, ib. Virûpâkcha) and *Tamonten* (多聞天, ib. Vâis'ramana). See also Mayer's Hdbk. p. 310.

Digitized by Google

the Dark Officers of the Five Hells, Tenshô-Daijin-Gû of Isé in Japan, Hachiman Daibosatsu, Kasuga Daimiôjin, also of his patron-god, and of all the gods of the sixty and odd provinces of Japan.

M. Pagés mentions several edicts directed against Christianity which followed this of Iyeyasu, but I have not yet been able to discover the originals of them all. The edict of 1635 of which he gives a translation under the number 116 in the volume of appendices to his History appears to have differed little from one contained in the *Nagasaki Ongaku sho-dome*, dated 1652. In 1641 was published an edict prohibiting missionaries from landing in Japan, Japanese from visiting foreign countries, and the sale of arms to foreigners. This seems a repetition of the edict of Iyemitsu on his succession to the Shôgunate in 1623 (Pagés. p. 546). In 1654 a circular was issued to the daimiôs, instructing them that all foreign vessels which might put into Japanese harbours, with the object of negotiating, should be referred to Nagasaki, whence they were to be sent home. If they fired, efforts were to be made to sink them, but they were not to be pursued even in that case, if a favourable breeze enabled them to escape from the harbour.

The year 1655 produced a renewal of the proclamation by which rewards were offered for the discovery of missionaries and converts. It runs as follows:—

"Although the Kirishitan sect has been repeatedly prohibited, yet at every change of ruler it is right to issue a decree that rigid scrutiny must be made without cessation. Of course every suspicious person must be informed against.

Formerly 200 pieces of silver were given to one who denounced a Father (Bateren) and 100 pieces to him who denounced a Brother (Iruman). Henceforward the following rewards will be given:

To the denouncer of a Father ..... 300 pieces of silver.
" denouncer of a Brother ..... 200 " "
" denouncer of a catechist or of a member of the sect..... 50 " "

If concealment be practised, and the fact be discovered through some other channel, the other members of the offender's company-of-five will be considered guilty of an offence. This is therefore notified."

This decree was repeated in 1658, 1661, 1664, 1671, 1678 and 1682 in nearly the same terms. In 1711 the rewards above enumerated were increased to 500 pieces for a Father, 300 for a Brother, 100 for a catechist or member of "the sect," and a further reward of 300 offered for the discovery of persons, who after apostatizing from Christianity, had been re-converted. Catechists or converts who turned evidence against missiona-

Digitized by Google

ries or their own class were to receive 500 pieces, according to to the value of their information, and in case of concealment punishment was likewise threatened against the mayor of the village, the other members of the company-of-five to which the person guilty of concealment belonged, and against his relations. These edicts might still be seen on the public notice boards in every village up to the year 1868.

The means of detecting Christians were various. Mention is frequently made by foreign writers of the *E-fumi*, which consisted in making the person trample under foot a portrait of Christ, and Japanese documentary sources of information confirm the story. I find it spoken of in the "Art of Interrogating" contained in the *Kerisuto-ki*, in an application for Instructions made by the Governors of Nagasaki to the Council of State in 1658, and in the *Hekija-kwcanken-roku*. It appears that the picture was originally drawn or painted in ink, but in 1669 a Nagasaki artizan "made a casting in copper representing the deity of the Christians" and all the inhabitants of the town were made to trample on it. The *daimiôs* of the neighbouring provinces likewise obtained the loan of this image from the Governors of Nagasaki, and used it in putting their subjects to the test. Another expedient consisted in turning the Buddhist priests into inquisitors. The regulations attached to Iyeyasu's edict of 1614 direct that every year the priests shall visit their parishioners at the period of the *Bon* feast, in the seventh month, to read prayers, and ascertain that there was no falling away on the part of members of the family; and the result of this examination was consigned to a register, which was eventually sent in to the Ecclesiastical commissioners. This practice was also in force, I have been informed, up to the year 1868.

Further, functionaries called *Kirishitan bugiô*, or Commissioners for the detection of Christians, were appointed, the earliest of whom was Inouye Chikugo no kami, whose name appears so frequently in the memoirs. A form of oath was imposed on these commissioners, by which they bound themselves to serve the Shôgun faithfully in this matter, to act with perfect impartiality, unaffected either by considerations of natural affection or by personal enmity, to maintain harmonious relations with their colleagues, and to be perfectly frank and open to the Shôgun when he required any information concerning the progress of their investigations. Two drafts of such oaths are to be found in the *Kerisuto-ki*, dated 1658 and 1662, the latter

Digitized by Google

of which has attached to it the signature of Yasuda Wakasa no kami, a *hatamoto*.

Besides the measures of domestic police adopted by the Government with the object of suppressing Christianity, they exacted from the representative of the Dutch Trading Company an engagement "not to hold any communication with the Kirishitan Sect, not to bring any missionaries into the country", and to communicate every year "any information concerning the the Kirishitan Sect which it may be desirable for His Highness to hear." This formality appears to have been repeated on several occasions, if not on all, of the Dutch Envoy to Yedo taking leave of the Shôgun. In the Japanese sources I find that Zacharias Wagenaer, Capitan in 1659 and 1661, made the declaration, and another occasion was in 1673 (*Kerisuto-ki*, M.S., and *Nagasaki Onyakusho dome*, M.S.).

Similar orders were given to the Chinese who traded at Nagasaki, as early as 1641. The whole crew of any junk in which a missionary should reach Japanese shores, were to be put to death, but pardon and rewards were promised to any of the crew who should turn informer. Carrying letters or messages to Christians was prohibited under pain of severe punishment. The reward for denouncing a Christian who had taken passage in a junk was to be double the sum with which the captain had been bribed to take him on board. This decree was renewed in more distinct language in 1675. It appears that in 1695 there was discovered on board a junk a description of Peking in the Chinese language, which contained an account of the Roman Catholic Cathedral in that capital and some mention of Ricci, the Jesuit missionary. The captain and crew were subjected to a rigid examination, the result of which was that they were found to be innocent of evil designs, but the captain was forbidden to trade to Japan for the future.

The measures taken for the detection of Christians were not fruitless. From a return dated 16th of the 6th month of 1658, it appears that a very large number must have been discovered during the preceding twenty years, beginning in 1639 with the arrest of Pedro Cassoui, Martino Shikimi, (both martyrs) Juan (or Syovan) the apostate [14] and another priest not identified.

---

14. Charlevoix VII. p. 203 conjectures that Syovan was the Jesuit Father Ferreyra, but it will be seen that this is unlikely.

Digitized by Google

In each of the following towns 'many' Christians are reported as having been detected.

- * Sendai
- * Aidzu
- Nihommatsu
- Nambu (district)
- Shirakawa

} in Ôshiu

- Nobusawa
- Kubota

} in Dewa

- Nikkô
- * Kiôto
- * Fushimi
- * Ôsaka
- * Sakai
- Shimo-Otowa
- * Wakayama, in Kishiu
- * Kanazawa
- Komatsu

} in Kaga

- * Hiroshima, in Geishiu
- Tsuyama, in Mimasaka
- Takamatsu, in Sanuki
- Usuki
- Hiji

} in Bungo

- * Ômura and
- Kumamoto.

Churches or seminaries had formerly existed in all those towns to whose names an asterisk is prefixed in the above list. It is of course impossible to estimate the number of Christians arrested at each of these places, but in the case of Ômura they must have amounted to hundreds. The Nagasaki *Onyakusho-dome* [15] (M. S.) contains an entry concerning the manner in which the Christians from that town are to be disposed of. It is therein ordered that ten per hundred be retained in prison, to be used as witnesses in any future trials. Ten are to be assigned to those of the informers who have been most active in hunting up victims. Eighty per cent are to be decapitated. "If "the remaining forty odd," "continues the record, who are entered in the books are found "to be undoubted Christians, they are all to be decapitated, "without further examination of their relations or the in-"formers." But we can hardly suppose that the word 'many' is to be understood in every case to mean hundreds. In the majority of cases a vague indication of the numbers is given, e. g. 3 or 4—7 or 8 and so forth, but adding these together, I find that the Christians arrested during these years in other parts of Japan than the above mentioned, numbered about

15. Record of the Nagasaki Office.

Digitized by Google

three hundred and fifty, of whom fifty belonged to the despised classes of beggars *(kojiki)* and pariahs *(eta)*. Of the whole number throughout Japan some seventy or eighty belonged to the *samurai* class. In the following provinces, no arrests were made, Ohosumi, Hiuga, Shima, Kai, Hôki, Tango, Awa, and the island of Oki, to which may be added the province of Satsuma, the only arrest reported from there being of four foreign and one Japanese Bateren, and four catechists. These Bateren were evidently the Jesuit Fathers Rubino, Capece, Mecinski, Moralez and Marquez.[16] In 1661 Kurokawa Yohei, before proceeding to Nagasaki, of which town he was a Governor, asks the Ministers of the Shôgun for instructions as to Christians whose interrogatory had already been commenced by his colleague Tsumagi Hakoyemon. A report to the Council dated 1668 speaks of a hundred and sixty-three suspected Christians who had been in prison for some time, and says that 'the years 1667 and 1668 must have furnished an additional number of several tens of accused persons.' The memorandum annexed to the proclamation against Christianity which was repeated in 1671 speaks of arrests continuing to be made. Okano Magokurô, another Governor of Nagasaki, in 1674 presents an application for instructions concerning the treatment of accused persons, in the course of which he suggests that suspension in the pit should be applied only to those who had been condemned to death, for while some were able to endure it for five or even seven days, weaker constitutions sometimes gave way after an hour or two, and thus frustrated the hope of obtaining evidence from them. By 1686 the few remaining Christians had learnt how to conceal their belief and the practice of their religion so well that the Council issued a circular to the chief *daimiôs* of the south-west stating that none of the Kirishitan sect had been discovered of late years, owing perhaps to laxness on the part of those whose duty it was to search for them, and enjoining vigilance. I have not found any evidence to show that any suspected persons were arrested later than this year, excepting of course the Abbé Sidotti in 1709, whose history has been made known by the distinguished scholar the Rev. Dr. S. R. Brown, through his translation of Arai Hakuseki's *Seiyô-Kibun*.

Considerable obscurity has hitherto hung over the fate of the last bands of devoted missionaries which sailed from Ma-

16. Bartoli V. 195, Pagès, 872.

Digitized by Google

nila in 1643. Bartoli writing in 1659, Charlevoix in 1735 and more recently M. Leon Pagés, in his valuable Histoire de la Religion Chrétienne au Japon, all state that the five fathers of whom the mission was composed suffered martyrdom: but the fact does not seem to have been ever authenticated by direct evidence. The contrary account, except in the case of a single missionary, is given by a Japanese source.

The *Kerisuto-ki*, M. S. already quoted, furnishes the following information:—

"Twenty-one years ago in the year of the tiger (1638) four were "reported from Sendai, the territory of Matsudaira Mutsu no kami, "in Ôshiu; these were the Japanese *bateren*, Fuhaa Heitoro, Maru-"chiino Ichisaemon, the Namban Bateren, Furanshisuko Magoemon, "and Shiyuan Hauchisuda. After the defeat of the Shimabara in-"surrection in the reign of Taiyû-In, the Bateren 齊庵 (Jiuan), "Maruchiinio Ichizaemon, and Kibe Betoro were brought under "arrest from Sendai, and four times brought before the Hiôjôjô, "but their examination was not concluded. Later Sanuki no "kami went to his second mansion (shimo-yashiki), and the three "Bateren were summoned before him. Takuan[17], Yagiu Tajima "no kami and others assembled, and they put questions con-"cerning the doctrines of the sect. After two or three days "Nakane Iki no kami appeared as High Messenger (from the "Shôgun) and instructed Chikugo no kami that he was not to "produce the above three men at the Hiôjô-sho, but to examine "them by himself.

"The above three bateren were examined during ten days at "Chikugo no kami's on the laws of Kirishitan, and after ten days "Chikugo no kami sent his retainers to the three bateren in "prison, and ordered them to be tortured. They caused 齊庵 "of the Compania and Maruchiyo Ichizaemon to apostatize "*(korobase)* and to repeat the invocation to Buddha. They were "summoned to Chikugo no kami's residence, and allowed to remain "there a year or two, after which time both fell sick and died. "Kibe Beitaro did not apostatize and was put to death by suspen-"sion. The reason of this was that at that time there was "want of (skill in inducing apostasy). Two catechists were "suspended in the same pit with Kibe, and therefore persuaded "(? the officials) to kill Kibe. After his death both apostatized. "They were removed from the pit, and placed in prison, where "they lived for many years. Subsequently Furanshisuko Magoe-"mon and Berunarutou Ichizaemon, two Namban Bateren, were "arrested by the authorities. Both of them were *Furate*. They "were frequently examined at the residence of Chikugo no kami, "but as the procedure was still unskilful they could not be brought "to apostatize, and were condemned to be burnt to death in "Shiba.

"In the year of the horse (1643) [were arrested] in Chikuzen "Heitoro, Furanshisu, Aronso, Chiyoseifu, all of them Namban "Bateren, and one Iruman. This man was a native of Mogi, near "Nagasaki, who had gone abroad, and become an Iruman. Be-"sides five catechists. These were arrested by a China-

17. A Buddhist priest, b. 1572 d. 1645.

Digitized by Google

"man in the time of Chikugo no kami, and delivered up. Being "sent to Nagasaki they were cast into prison, and in the follow- "ing year all ten were summoned from Nagasaki to Yedo, "where they were handed over to Chikugo no kami, who "subjected them to a searching examination. After being "put to the torture all four twice apostatized, repeated the "invocation to Buddha, and signed a declaration that there "was no deception in their apostacy. The Iruman and "catechists apostatized before the Bateren, one or two at a "time, and joined Japanese sects. A prison was constructed in- "side Chikugo no kami's mansion, in which the four Bateren were "confined. They were frequently summoned before him and "examined repeatedly as to the designs harboured in Namban and "Luçon, whence the Bateren were sent to Japan, and as to the "Kirishitan law. Makino Sado no kami, Kuze Yamato no kami[18] "and others used to visit Inouye Chikugo no kami, and put ques- "tions to which the replies were given. Subsequently Aronso "recanted, in consequence of which he was placed in the "wo- "man's godown," where he fell sick and died, after having con- "tinued to live during twenty days. In order to die by a "sort of suicide called *zejiun*, it is said to be the rule to eat very "little, so that the body becomes weaker and death ensues. He "did so, and thus came to his end. Furanshisu having been impri- "soned with a woman, became 'friendly 'with her, and confessed. "They were exhibited to the inmates of the prison, and the latter "were commanded to witness this rare event, the marriage of a "Bateren. After the couple had been made to exchange the matri- "monial cup, they were removed to Chikugo no kami's residence, "where they passed the rest of their lives. Peitoro, Chiyoseifu, "the Iruman, with catechists and members of the sect to "the number of twenty, were placed in the charge of Chi- "kugo no kami, alterations being made for that purpose at the "mansion in Kobinata. Chiyoseifu took the name of Sanyemon, "and a wife was given to him. He is still alive. Peitoro fell ill and "died on the first day of the third moon of the third year of Mei- "reki (1657). They signed a declaration ackowledging that the "Namban Bateren had recanted and used the invocation to Buddha, "and gave it in to the authorities."

"It is said that during the century or so which elapsed from the "arrival of the Bateren Maruseiro at Yamaguchi in Suwô, whence "he passed into Bungo and persuaded the Ôtomo who dwelt there "to become Christians, one hundred and five Bateren came to "Japan. It is stated too that not only the Namban Bateren but "the Japanese Bateren, after being examined as to the merits of "their sect, were all tortured into repeating the invocation to "Buddha, made to seal a declaration and obliged to apostatize. "Chikugo no kami was the first to accomplish this. Seven men's "allowance of rice was granted to the catechists ten men's allow- "ance to the Bateren, and a thousand *momme* in silver. They "were all kept inside a stone wall, and frequently subjected to "interrogation; and it was ordered that if they did not say that "Namban had designs upon Japan, they were to be tortured."

The names contained in these extracts are transliterated without alteration from the Japanese, but most of them can be identified without difficulty. Fuhaa Heitoro and and Kibe Betoro or Beitoro

18. Daimiôs, members of the Shôgun's Council, or *Gorôjiu*.

Digitized by Google

are evidently one and the same person, namely the Japanese Jesuit P. Cassui Pietro (Bartoli, Il Giappone lib. V. p. 174; Charlevoix VII, p. 179), whom M. Pagés mentions also in his work already cited, 1-ere partie, p. 850. Maruchiino Ichisaemon is probably the same person as the Padre Schichimi Martino mentioned by Bartoli, (ib. p. 195) Charlevoix (ib. p. 180), and by M. Pagés, (p. 873). I find nothing in either Bartoli, Charlevoix or M. Pagés which would serve as a clue by which to identify the foreign priest here called Furanshisuko Magoemon. Shiyuan Hauchisuda is apparently the same as 斎庵 (Jiyuan· Juan or Joao) mentioned in the second extract. This man is said to have been a native of Canton, and his death took place at Yedo in 1697 at the age of eighty. He was buried at a Buddhist temple called Murió-In in the suburb of Koishikawa, outside the northern moat of the castle. He appears to have been a Jesuit father, probably the same whom Schaep calls Siovan and takes for a Spaniard[19].

Berunarutou (Bernardo) Ichizaemon is also not mentioned by either of the three historians of the church. He and Francisco Magoemon are said to have been Frate, by which is probably meant not lay-brothers, but members of one of the orders which according to Japanese accounts had taken the north and east of Japan for the field of their operations, leaving the western part to the Jesuits.

The five who are said to have been arrested in Chikuzen are easily identified as the Jesuits fathers Pedro Marquez, Francisco Cassola, Giuseppe Chiara, Alfonso Arroio (or Alonso Arroyo) and the Japanese Brother Andrea (Bartoli, op. cit. p. 196, Pagès, 878). Charlevoix (VII, p. 182) places the port of their disembarkation somewhere in the Loochoo group.

"Tout ce qu'on a scu de plus certain de leur expedition, c'est qu'ayant débarqué aux Isles Lequios, qui dépendoient des lois du Roi de Saxuma, ils y furent Saisis, et menéz a Jedo par ordre de l'Empereur, qui leur fit scier les membres; que trois moururent sur le champ, et que les deux autres furent reportez en prison, où il y a bien de l'apparence qu'ils ne vécurent pas longtems. Nous n'avons, pour fixer le tems de leur Martyre, que ce qu' en est rapporté dans un Journal des Hollandois, à l'occasion d'une avanture fort triste, qui arriva à un Navire de cette Nation."

Mr. Pagés says that they "had arrived in the north of Japan," but I do not know on what authority he makes this statement. Probably there is some confusion here between the case of Schaep who was arrested in Nambu, and who is mentioned by M. Pagés in the same paragraph with the five Jesuits, and the case of the latter. Montanus, in speaking of the meeting between Schaeps and his companions with four Portuguese priests (namely the four Jesuit fathers above-named) at Yedo, says that they had

19. Montanus, Engl. edit, p. p. 328, 330, 332.

Digitized by Google

been brought from Nagasaki (Engl. edit. of 1670, p. 332). And the statement in the *Kerisuto-ki* that they were arrested in Chikuzen is corroborated by the *Hekija Kuwan-ken roku* (vol. I, p. 22 v.)

This discrepancy between the accounts given by Bartoli and in the *Kerisuto-ki* is great. The former says: "And whoever shall "have to describe how they were sawn while alive, as was actually "done to them in a public street in Yedo, after having undergone "other tortures, and how they were reconducted, half dead, to their "prison, the death of three of them there, and the end of the other "two, who were kept alive, but in a more dangerous kind of death, "because the Shôgun in the meanwhile had a daughter born to him, "will have to distinguish the real truth from the falsehoods which "the Dutch Heretics have mixed up with it in their journals." Charlevoix seems to have followed Bartoli. On the other hand Mr. Pagés says, *loc. cit.* that the Captain and crew of the Breskens were present at the examination and torturing of the five Jesuits, three of whom died on the spot, while the other two were carried back to prison where they died shortly afterwards. Montanus, in telling the story of Schaep and his companions, nowhere says that they were actually present at the torturing. On one occasion "being "carried into the Place of Audience, they were commanded to sit "down on Mats by four *Jesuits*, who looked exceeding pitifully; "their Eyes and Cheeks strangely fallen in; their Hands black "and blue; and their whole Bodies sadly misus'd and macerated "by Torture. This Company amaz'd the *Hollanders*, who were "not able to judge the Reason of their being placed by the four "*Jesuits*."

"These though they had Apostatiz'd from the *Christian* Faith "yet declar'd publickly to the Interpreters *Kytsbyoye* and *Phat-*"*syosamon*, that they did not freely Apostatize: but the insuffer-"able torments which had been inflicted upon them, had forc'd "them to it." [20] This corroborates very closely the account in the *Kerisuto-ki*. The Hollanders were subsequently told by the servants of the house where they lodged, that "two of the four *Romish* "priests had recanted their denying of the *Christian* Faith to "embrace the *Japan Religion*." [21] This was merely hearsay evidence, but from its very nature, as being more to the credit of the tortured prisoners than to that of their judges, is likely enough to be true, and corresponds nearly to the statement in the *Kerisuto-ki* that Alonso Arroyo recanted.

In the memorandum concerning the examination of the Jesuits signed by Inouye Chikugo no kami, dated the 8th day of the 9th month of the year 1643, which allowing for the difference of the Japanese and European calendars would correspond to some day

20. Montanus, Engl. edit. 1670, p. 356.
21. Montanus, ib. p. 367.

Digitized by Google

in October, they are stated to have confessed that "there were "four Japanese Bateren in Luçon, one of whom was related to "Kagayama Hayato a native of Buzen, who some years previous- "ly had been condemned to be burnt. They had been told in "Luçon that the Bateren, his relative, was to be sent to Japan. They "had also been told that a Namban Bateren was to cross "over to Japan in the following year. Besides these, they had "heard that two Japanese children were to be educated as Bateren, "in order to be sent over to Japan. It was commonly reported "that in this way a large number of Bateren were to be "brought up in various countries, to be sent to Japan in a con- "tinuous stream[22]."

With this may be compared the following extract from Montanus, wherein the only difference is the supposed intention of sending the four Jesuits to Batavia.

"After that, the Hollanders understood from *Phatsyo saymon* "and their Landlord's Sons, that the Emperor kept the four *Jesuits* "in Prison, till *Elseraks* coming thither, (two of these four were "*Italians*, the third a *Castilian*, and the fourth a *Portugal*) that "by him they might be carry'd over to *Batavia*: So escaping "with their lives from a terrible Death, because they stagger'd "in their Religion, and discover'd a secret, at which the *Japan* "Emperor seem'd to be highly concern'd; the Plot was, that let "it cost what it would, Money and Blood, the *Jesuits* would "anew undertake their ancient design in *Japan*: It was absolutely "concluded, yearly to send *Roman* priests to Japan from the "*Manilla's*, and in short time two Native *Japanners* should be "sent thither, and be receiv'd in the *Jesuits* Orders, by which "means they promis'd great matters to themselves, because they "not only understood the *Japan* tongue exceedingly well, but "were of the same Nature and Disposition of their Countrymen, "and therefore might be more private from the common Persecu- "tions being less suspected than Out-landish Priests. By this "means they thought for time to come, to play their game, and "the more, because the *Christians* in all places, as if they arose "out of the Ashes of the Martyrs, began to Live afresh. So that "the Emperor was puzzled, seeing no small danger to threaten "his Crown; wherefore, he contrary to all those that had been his "Predecessors, was at the Examination of *Christian* Prisoners, or "*Portugal* Priests himself, out of meer fear of an Insurrection."

In consequence of the belief entertained by the Shōgun's government that such a design was actually entertained by the Roman Catholics interested in missions, orders were issued in 1656, thirteen years later, 'that strict vigilance must to be practised to pre- 'vent any "Bateren" from finding his way into the country. Suf- 'ficient time had elapsed for the children who were believed to 'have been sent some years back to Namban to be educated as 'priests, to have reached an age at which the project could 'be carried out. The execution of the plan would no doubt be

22. Vol. 1. p. 23v.
23. Montanus, ib. p. 372

Digitized by Google

'facilitated by their being able to pass themselves off as native 'Japanese, by manners, dress and clothing. Punishment was 'therefore threatened against any one, who knowing of 'the arrival of a foreign vessel should neglect to give in- 'formation; his whole family and the inhabitants of the same 'locality would be involved in his offence[24].'

It remains to trace the history of the three Jesuits who according to the *Kerisuto-ki* did not recant their denial of Christianity. Francisco Cassola married a Japanese wife, and lived many years in Chikugo no kami's mansion, but the date of his death is not mentioned therein. Father Pedro Marquez died in 1657. Giuseppe Chiara received the name and swords of Okamoto Sanyemon, a criminal who had suffered capital punishment. He was married to a Japanese woman of Misaki in Idzu, who is said to have been previously the wife of a criminal condemned to death. A man servant and a maid were also placed at his disposal. He resided for some forty years in the *yama yashiki*, and dying in 1685 at the age of eighty-four was buried at the temple of Muriô-In, in the uburb of Koishikawa behind Dendzû-In. Brother Andrea Vieyra, who was arrested together with the four Jesuit fathers, took he name of Nampo. He died in 1678, and was likewise buried at the temple of Muriô-In.

Mention is also made in the *Kerisuto-ki* of a Sicilian of Palermo who was arrested in June 1643 at Yakiu island in Chikuzen. On being examined, he confessed that he had come to Japan for the purpose of teaching Christianity. He was handed over to Yamazaki Gompachirô, the Governor of Nagasaki, and sent to Yedo where he arrived on the 13th of the 7th month. He was placed in charge of Inouye Chikugo no kami, the commissioner for trying Christians (*Kirishitan Bugiô*), by whom he was frequently examined, and, it is to be inferred, eventually induced to deny his creed, since he was transferred to the *yashiki* where Giuseppe Chiara and Br. Andrea Vieyra were confined, and received an annual allowance of a thousand *mommé* of silver (60 *mommé* = one tael), and ten men's allowance of rice (five *shô* or nearly two bushels per diem). Lastly, among the inmates of the *Kirishitan yashiki*, as it was popularly called, was an Annamite Christian named *Jikuan*, who died in 1700 at the age of seventy-eight, and was buried at Muriô-In like the rest.

The buildings in which Father Guiseppe Chiara and the other missionaries who had been forced to abandon Christianity, were confined, stood upon a site close to *Kirishitanzaka*, a steep lane leading westwards from the left hand side of Tachigi-chô in the suburb of Koishikawa. Here was afterwards erected the residence of a *hatamoto* whose family name was Miura, but at the present

24. Nagasaki On Yakusho dome, M. S. vol. I.

Digitized by Google

moment the land has been converted into a vegetable garden. In one corner is a half-filled up well, reputed to have belonged to the church which local tradition says once occupied the spot. Further down the lane is an irregular block of stone, said to mark the tomb of 'Hachibei,' a servant of the Christians, before which flowers and water are from time to time offered up, perhaps by modern adherents of the faith, perhaps by superstitious pagans who desire to propitiate the manes of a possessor of the dread magic powers in which Kirishitan is believed by the unlettered Japanese to consist. Behind this stone is a copse of bamboos, on the spot where a prison for the confinement of Christians is supposed to have stood.

The tomb of Father Chiara may be seen on application to the Buddhist priests of Muriô-In. It consists of a square stone pillar surmounted by an extraordinary cap-stone, evidently carved so as to represent the hat of a Jesuit missionary, such as may be seen depicted in Montanus. An inscription on the front records the date of his death and the posthumous name conferred on him according to Buddhist practice. My copy of the *Kerisuto-ki* states that he died on the 25th of the 9th month, while the inscription on the tombstone gives the 25th of the 7th month. A report addressed to the Government of the Shôgun somewhat more than twenty years ago contains a note concerning the person buried under this stone, which states that he was a teacher of Kirishitan and a foreigner; that he became a proselyte of the head-priest of the monastery of Muriô-In, and received the name Sôyemon. Here is again a slight discrepancy, but not sufficient to justify any doubt of the identity of Sôyemon with the Okamoto Sanyemon of the *Kerisuto-ki*. The date assigned for his death by the report is the 25th day of the 9th month of the 2nd year of Jôkiô (1685), which accords exactly with that given in the *Kerisuto-ki*. At my request the priests of the monastery searched their records for notices of the other three Christians said to have been buried in the same cemetery, but they were unable to discover any particulars concerning them or their graves.

The Rev. J. Soper remarked that traces of the influence of the early fathers had been found in the neighbourhood of Nagasaki, where a number of adherents still existed amongst the humbler classes. This was proved by the retention of such words as Crucifix, Maria, Santa, Padre—a fact which was accidentally discovered by a boy being observed making the sign of the Cross, and on further enquiries being made, resulted in the discovery of the existence of such words as those above mentioned.

The Chairman, after proposing that the thanks of the Meeting be given to the author for his interesting paper, which was carried by acclamation, declared the meeting adjourned.

Digitized by Google

AN ANALYSIS OF CERTAIN ARTICLES OF JAPANESE FOOD.

Shiyakujo, Ôsaka, 30th July, 1877.

To E. SATOW Esq.,

Corresponding Secretary of the Asiatic Society.

Amongst the articles which the Shiyakujo of Ôsaka has sent to the Exhibition of Tôkiô there are several kinds of food, together with a report of their analysis. The time for analysing them being very limited (three weeks only), the analyses have been necessarily incomplete.

Four kinds of Red Beans, called *Adzuki*, No. 1, 2, 3 and 4 were successively examined, these being the seeds of *Phasæolus radiatus, Linn.* var. *subtrilobata*. These beans form one of the principal articles of food of the Japanese, and are also especially used by those who suffer from *biri-biri*, they being supposed to act as a diuretic. But excepting a certain red-coloured matter, I have not yet found anything in these beans which is not always to be met with in seeds of the genus *Phasæolus*; the examination, however, is still going on. No. 5 a variety of hulled rice, called *Mochi-gomé;* No. 6 common hulled rice *(Komé);* No. 7 rye and No. 8 wheat, all of native growth and all of last year's production.

Digitized by Google

Analyses.

No. 1.—Red Beans (*Adzuki*), large kind.

Specific gravity	1.276		
Water	14.58	per cent.	
Ashes	2.76	„	
Fat	0.35	„	
Nitrogen	2.86	„	corresponding to about 17.9 per cent. of albumen.

No. 2.—Red Beans (*Adzuki*), small kind.

Specific gravity	1.300		
Water	13.29	per cent.	
Ashes	2.95	„	
Fat	0.30	„	
Nitrogen	2.96	„	corresponding to about 18.5 per cent. of albumen.

No. 3.—Red Beans (*Adzuki*), large kind.

Specific gravity	1.284		
Water	16.08	per cent.	
Ashes	2.77	„	
Fat	0.34	„	
Nitrogen	2.84	„	corresponding to about 17.7 per cent. of albumen.

No. 4.—Red Beans (*Adzuki*), small kind.

Specific gravity	1.289		
Water	13.01	per cent.	
Ashes	3.03	„	
Fat	0.32	„	
Nitrogen	2.95	„	corresponding to about 18.4 per cent. of albumen.

No. 5.—Rice (*Mochi-gomé*).

Specific gravity	1.394		
Water	14.00	per cent.	
Ashes	1.14	„	
Fat	2.36	„	
Nitrogen	0.972	„	corresponding to about 6.07 per cent. of albumen.

Digitized by Google

No. 6.—Common Rice (*Komé.*)

Specific gravity 1.370
Water ..... 11.18 per cent.
Ashes .... 1.22 „
Fat..... 1.43 „
Nitrogen ..... 0.981 „ corresponding to about 6.13 per cent. of albumen.

No. 7.—Rye (*Hadaka-mugi.*)

Specific gravity 1.384
Water ..... 13.49 per cent.
Ashes ..... 2.02 „
Fat ..... 0.97 „
Nitrogen .... 1.49 „ corresponding to about 9.8 per cent. of albumen.

No. 8.—Wheat (*Mugi*).

Specific gravity 1.269
Water ..... 12.38 per cent.
Ashes ..... 1.93 „
Fat..... 1.56 „
Nitrogen ..... 1.50 „ corresponding to about 9.4 per cent. of albumen.

To determine the amount of fat, I used a liquid which I have always found admirably suited for this purpose when analyzing seeds, viz., *Petroleum ether* (so called by the Dutch). This ether may be easily obtained by fractional distillation of naphtha, which owing to the opening of petroleum wells, has recently become an article of trade ; the Japanese know it under the name of *Seki-nô-yu* or *Ko-sei-yu* or *Ki-hats'-yu*. As far as I know, this naphtha is principally used in the lanterns, which now, during the summer evenings, serve as imitations of gas light. I fancy that owing to its highly inflammable nature, it must be a dangerous plaything for those who use it. The naphtha gives about one-third of ether at a very moderate cost, while the residue can be used as kerosene oil.

I am, dear Sir, most truly yours,

B. W. DWARS.

Digitized by Google

Shiyakujo, Ôsaka, 18th October, 1877.

To E. SATOW ESQ.,

The Corresponding Secretary of the Asiatic Society

DEAR SIR,—Last August I sent you some notes about analyses of Japanese Food, since which I have examined the two kinds of rice and two of red beans more minutely, and now beg to lay before the Asiatic Society the result of my experiments as a supplement to the first notes on these two important articles of food.

It is as follows:

No. 3.—Red Beans, called *Adzuki* (large kind).
Specific gravity 1.284.

Water	16.08	per cent.
Ashes	2.77	„
Fat	0.34	„
Nitrogen 2.84 per cent. corresponding to about: Albumen	17.75	„
Sugar and Gum	10.60	„
Starch	37.50	„
Cellulose, colouring matter, etc	14.96	„
	100.00	

No. 4.—Red Beans, called *Adzuki* (small kind).
Specific gravity 1.289.

Water	13.01	per cent.
Ashes	3.03	„
Fat	0.32	„
Nitrogen 2.95 per cent. corresponding to about: Albumen	18.44	„
Sugar and Gum	12.30	„
Starch	34.50	„
Cellulose, colouring matter, etc	18.40	„
	100.00	

Digitized by Google

No. 5.—Rice, called *Mochi-gomé.*

Specific gravity 1.394.

Water	14.00	per cent.
Ashes	1.14	„
Fat	2.36	„
Nitrogen 0.972 per cent. corresponding to about : Albumen	6.07	„
Sugar	0.13	„
Starch	71.70	„
Cellulose, etc.	4.60	„
	100.00	

No. 6.—Rice, called *Komé.*

Specific gravity 1,370.

Water	11.18	per cent.
Ashes	1.22	„
Fat	1.43	„
Nitrogen 0,981 per cent. corresponding to about: Albumen	6.13	„
Sugar	0.15	„
Starch	74.60	„
Cellulose, etc.	5.29	„
	100.00	

I remain, dear Sir,

Yours faithfully,

B. W. DWARS.

Digitized by Google

THE INTRODUCTION OF TOBACCO INTO JAPAN.

BY

ERNEST M. SATOW, Esq.,

Japanese Secretary H. B. M.'s Legation.

Read before the Asiatic Society of Japan, on the 10th November, 1877.

—o—

Various dates are assigned to the introduction of tobacco into Japan by different native writers. Kaibara Yoshifuru in the *Wajishi* (和事始, vol. IV. p. 7) says "it first came to Japan about the tenth year of Keichiyau (慶長)," that is, 1605 of our era; but he does not explain whether he means the dried leaf fit for smoking, or the plant itself for purposes of cultivation. The next authority in point of antiquity is the Japanese Encyclopædia (和漢三才圖繪) published in 1714, in which work (vol. 99, p. 20 verso) we find the statement that "Tobacco seed was first brought as tribute by the ships "of the Nañbañ in the chronological period Teñ-shiyau (天正)," that is to say, between 1573 and 1592. Nañbañ, or Southern barbarians, was applied to the Portuguese of Macao and Spaniards of Manila, as well as to natives of other countries who came to Japan in the train of those nations (the Dutch and English excepted), but as the first Spanish mission under Lupo de Liano did not arrive before 1592, the last year of this chronological period, it

Digitized by Google

is safest to limit the use of the term here to the Portuguese. From 1573 to 1592 is a long interval, but we have no means of fixing with greater precision the date here implied. The Encyclopædia proceeds to state that "it was planted on a hill (東土山) near Nagasaki." A rather rare little work entitled "Notes on Tobacco" (煙草記), by an anonymous author, which bears the date of 1756, quotes the account given in the Encyclopædia, and repeats after Kaibara that it was "first "brought to our country by the Nañbañ men during the period Keichiyau," or between 1596 and 1615. The same book mentions further a story of the first importation having been made from Korea, also during Keichiyau, and adds a statement that the officers and men of Hideyoshi's expedition against Korea, having learnt to smoke whilst on service, brought tobacco with them when they returned home. In the *Enroku* (蕪錄), a very elaborate work on the subject of tobacco, written in Chinese by a Japanese author, Ohotsuki Bañzuwi, the preface of which is dated 1797, a previous author is quoted, who states that tobacco was first planted at Nagasaki, in a locality called Sakura-no-Baba, in 1605, and several authors concur in giving this date for the commencement of its cultivation. The family records of a doctor named Saka Jiyauchi-Iñ contained (in 1815) two or three passages * which help to fix the date. In 1607 there is an entry to the following effect: "Of late a thing "called tobacco has been in fashion. It is said to come "from Nañbañ. Broad leaves are cut up and lighted, "and the smoke is swallowed." Under January—February 1609 there is a further entry: "For the last two or "three years an article called tobacco has come from Nañ-"bañ, and all classes of Japanese amuse themselves with "it. It is said to be a remedy for all diseases. But on "the other hand, cases have occurred of persons falling ill "who had inhaled it, and as no medical work contains any "directions for the treatment of such patients, no medicine

* Quoted in the Me-zamashi-gusa and 嬉遊笑覽 M.S.

Digitized by Google

"could be administered to them." An author who writes under the assumed name of Touya Sanjiñ (東野山人) says: "1605. This year tobacco was brought in the "ships of the Nañbañ men, and was sown. The inhabit- "ants of the capital vied with each other in inhaling it, "and it eventually spread over the whole empire." In the *Me-zamashi-gusa* (printed 1815) there is quoted a statement that in the Registers of Land Assessment of the town of Idzumozaki in Echigo the term 'Tobacco-dealer' occurs as far back as the years 1578 and 1579, so that, if this be exact the leaf must actually have been an article of commence at that time. We shall perhaps be safe then in assuming, in spite of the Encyclopædia, that tobacco began first to be cultivated in this country at the commencement of the seventeenth century, but that it was imported as an article of commence a couple of decades earlier. There can, of course, be little doubt that the earliest Europeans who touched the shores of Japan, namely the Portuguese, might have made the use of the herb known to the inhabitants, seeing that it had been discovered by Columbus in 1492, fifty years before the date assigned by the native chronologies to the voyage of Pinto and his companions.

Before many years had elapsed the practice of smoking became very popular, and excited the apprehensions of the rulers of Japan. It is said, on the authority of a fragment of a lampoon which has been preserved, that Hideyoshi made a law against tobacco. Dr. Saka's family journals, already referred to, say that in the year 1609 there existed at the capital two associations of turbulent spirits called the Bramble Club and the Leather-breeches Club, whose chief amusement was to provoke quarrels with the peaceable inhabitants. The Brambles chose their title as symbolic of their love of mischief and the tenacity with which they held their victims, the Leather-breeches indicated by theirs that they considered themselves quite a match for their rivals. More than seventy of them were arrested suddenly, and thrown into prison, but justice was satisfied by the execution of four or five ringleaders, and

Digitized by Google

the rest were pardoned. As these societies were originally tobacco clubs, the plant through their misconduct became obnoxious to the authorities, and the use of it was prohibited. These roysterers smoked out of very long pipes, which they stuck in their sashes like a sword, or had carried behind them by a retainer. Here is the portrait (Pl. 1.) of such a pipe-bearer thirty years later, taken as he was accompanying his master home from the bath. It shows the style fashionable in the chronological period Kuwañei (1624-1644) after the edict against smoking had been revoked. The tobacco pouch is tied on to the stem.

In 1612 a proclamation forbidding trade in tobacco was issued, of which the following is a translation:—

"Tobacco-smoking is forbidden. The property of both offenders shall be granted to the discoverer of buyers and sellers thereof. If any one is caught conveying it by road, the tobacco and the seller must be seized on the spot and a report be made to the authorities; upon which the horse loaded with it and the [rest of the] merchandise shall be given to the discoverer.

Item....Tobacco is not to be cultivated anywhere.

The above order is to be promulgated without fail through all the dominions of His Highness (御領内). This has been decreed by him, and consequently the above notification is made. 8th month, 6th day, 17th year of Keichiyau."

The Shiyauguñ Hidetada in 1615 again issued a decree against tobacco, and the prohibition appears to have been repeated several times, but without effect. Its subsequent removal is attributed to the following stanza of Japanese poetry composed by the Mikado Go-Midzu-no-wo, who abdicated in 1629.

Mokudzu taku
Ama naranedomo,
Keburi-gusa,
Nami-yoru hito no
Shiho to koso nare;

Digitized by Google

which may be literally rendered

The smoke weed
Becomes the salt
Of the people who come in waves,
Though they are not fishers
Who are burning seaweed refuse.

The word *shiho*, salt, may also mean that amiability which should flavour social intercourse, and which the pipe is considered to promote in a high degree. There appears to be some process, alluded to in this stanza, by which table-salt may be obtained from the ashes of seaweed. A variation of this stanza ascribed to the Mikado Reigeñ (1663-1687), is given in the *Euroku*, Vol. 3.

Some years later, in 1551, we find the use of tobacco already recognized as legal by a notification forbidding people to smoke outside of their houses. One of the chief motives which are said to have prompted the anti-tobacco law, was the idea that the cultivation of the plant would interfere with the production of rice and corn, and this is confirmed by an order given in 1667 that tobacco was to be planted in lands specially reclaimed for the purpose, which order assigns the reason already given. Tobacco was also feared because fires had frequently occurred from carelessness in its use, and further, there was a notion that it was prejudicial to the general health.

It may be noted here that a decree issued in China in 1638, when the Ming dynasty was tottering to its fall, threatens with decapitation and exposal of the head after execution, any person found guilty of trafficking in tobacco with the 'outer barbarians.' This expression would naturally lead us to conclude that the plant was unknown to the Chinese previously to the dried leaf being imported as merchandize by Europeans. The celebrated traveller and naturalist Pallas, in a passage which has been quoted over and over again, argued that the use of tobacco for smoking in China must be more ancient than the discovery of America, the grounds of his opinion being chiefly the almost universal prevalence

Digitized by Google

of the custom among the Chinese and Mongols, the form of their pipes,' 'which the Dutch seem to have imitated,' and the peculiar manner in which the dried leaves are prepared. Botanists inform us that the plant which furnishes the Chinese tabacco is said to grow wild in the East Indies, and differs from the Virginian tobacco.† But Chinese literature affords evidence that tobacco was introduced into China by European traders. The Public Library at Asakusa possesses a manuscript entitled "Tobacco Memoranda" (煙草錄), which is a collection of poems by Chinese authors in praise of tobacco. Among these I find firstly, under the title of "Heavenly Fragrance" (天香) the following lines:

"Smoke weed, not mentioned in the Record of Shên Nung,
"In the end of the Ming it appeared. from Luçon outside the Min sea,
"They transported and planted it in the central land,
"And its name was called Tan-pa-ku."

Another piece begins:

"The fragrant sprouts of Min island,
"The green herb of the rude barbarian,
"Has been planted everywhere in the emerald gardens,
"A little is treasured up in a bamboo casket;
"First it came by the sea-ships".....

In a third poem there is the line:

"Its modest name was brought from Luçon."

Another commences thus:

"Luçon produces smoke weed."

And a fifth opens with:

"The strange seed was not in ancient times,
"But *paku* has spread over the whole land.
"The divine root is plentiful beyond the seas.
"They transplanted it from the south of Chang;
"How should Wupu ever have known it,
'Nor did Fungchuen find it out."

A poem in honour of the areca-nut says, indeed; "Of old I have heard that smoke-weed grew in Liaotung," but the date of this composition is not given, and its authority weighs little against the explicit statements previously quoted. The name tobacco variously translated, by 淡婆姑 (pronounced *tan-pa-ku*) and 淡巴菰, occurs over and over again in this collection, and much more

† See Johnston's Chemistry of Common Life, 1858, vol. I. p.p. 9—12.

Digitized by Google

frequently than the Chinese translation 'smoke-weed.' To this evidence may be added the fact that the Manchus, who are more likely to have learnt the use of the herb from the Chinese than from any other nation, have no other name for it than *tampako.*

A Chinese author cited in the *Enroku* speaks of tobacco being first known in Japan, while another says that the first notice of it known to him, occurs in a Corean history, from which it would appear possible that tobacco may have been introduced from Japan through Corea into the north of China about the same time that it began to be imported from the south by way of Macao. It has been stated by a Chinese writer, when and where I cannot ascertain, that smoking was rare in China in the beginning of the seventeenth century, but had become common about thirty years later.

In the Corean vocabulary given by Von Siebold in the Nippon, Bd. VI. Abtheil VII. p. 34, *tampa* is given as the equivalent of tobacco in that language, while Klaproth in his translation, Aperçu Général des Trois Royaumes, has *tampako*, but his pronunciation is probably derived from a Chinese source. In Loochoo, if a manuscript vocabulary in my possession may be trusted, *tabako* is the word used,—evidently borrowed from the Japanese.

It appears doubtful whether the pipe was introduced into Japan together with tobacco. We find it stated that the dried leaf was at first rolled up in a piece of paper, in a conical form, the tobacco being placed in the larger end of this sort of cigarette. To this day there are localities where tobacco, instead of being consumed in a pipe, is rolled up in a leaf, generally of the camellia japonica, and smoked like a cigarette. This practice may be seen in the island of Ohoshima off Kishiu, and is said on good authority to be common on the adjacent mainland. The next step was to scoop out one end of a section of slender bamboo, and to place the tobacco in this widened part. Such a pipe is still in use among the fishermen of Loochoo. Finally foreigners brought pipes to Nagasaki, which the Japanese imitated in

Digitized by Google

copper and other metals, modifying the shape no doubt to suit their own convenience.

The Japanese word for pipe, *kiseru*, is said by many native writers to be of European origin, but there is no word meaning pipe that at all resembles it in any European language. The word *rau* used for 'stem' is also supposed by Japanese writers to be derived from a foreign word, and the nearest approach to it to be found in another language is *reu* or *o-reu*, which according to the *Enroku* is Annamite for 'pipe.' That Annamites came to Japan, and that Japanese visited Annam, during the beginning of the 17th century, are well ascertained facts. It is not improbable therefore that *rau*, the word now used by Japanese for stem, is a corruption of *reu*, pipe, and that pipes formed exclusively of one piece of metal, as the earliest forms seem to have been, were simply called *rau*. In the *Me-zamashi-gusa* (1815) is figured an iron pipe which is said to have been in the possession of a rich inhabitant of Yamagata in Dewa for a couple of hundred years (see Pl. II), which was no doubt the original form. It was fourteen English inches in length and so solidly made that it weighed the equivalent of seven and a half ounces avoirdupois. The guard which enabled the pipe to be used for striking, or kept the mouthpiece from touching the floor mats when laid down from time to time, is engraved separately, and there seems to have been a small hole on one side, which may have served, it is suggested, for attaching the tobacco pouch. Such a pipe was too heavy for every day use, and we can easily imagine that the idea of constructing the stem of lighter material, retaining the employment of metal only for the bowl and the mouthpiece, would readily find acceptance. A slender bamboo tube was selected for this purpose, and the new pipe was called a *kise-rau*,—*kise* meaning 'to put on' or 'over.' This word became corrupted into *kiseru* and even *kiseri*. Cuts of the other early Japanese pipes are given in the *Enroku*, and are reproduced in Plate III. The example of which only the two ends are shown bears the inscription "Minakuchi Goñbei Yoshihisa," probably the

Digitized by Google

residence and names of the maker; it had a bamboo stem three or four Japanese inches long. According to the owner's story this pipe belonged to Hideyoshi, which is hardly consistent with the tradition of his having prohibited the use of tobacco. From the *Me-zamashi-gusa* there is another pattern (Pl. IV.), concerning which it is uncertain whether it is of Japanese or foreign origin. Pl. V. No. 1 represents the pipe formerly used in the Corean colony of Nawashiro-gawa near Kagoshima, and Pl. V. No. 2 an Aino pipe carved out of a small branch of a tree (both from the *Enroku*).

Serembou or *Serimbou* is the word used by the Ainos for pipe, which may perhaps be composed of *kiseru* and *bou*, a stick, the initial syllable *ki* having been subsequently dropped under the impression that it meant *ki*, wood, and was therefore superfluous. There would be nothing strange in the Ainos borrowing a term for pipe from the Japanese, since they were always indebted to the latter for their supplies of tobacco, and I have even been informed that the same word *serimbou* is applied to pipes by the Japanese inhabitants of the north of Aushiu. If this be true, it goes to support the conjectured etymology of the word.

The tobacco tray *(tabako-bon)* in common use always contains a fire-pot *(hi-ire)* and an ash-pot *(hai-fuki)*, the latter of which may also be used as a spittoon. The tray used by the master of the house frequently has a drawer underneath for his tobacco, while the visitor is usually supposed to carry his own in a tobacco-pouch. There is a large kind of tray used on occasions of ceremony, which may have gone out of fashion of late years, called *shiyo-in*, or drawing-room, *tabako-bon*. It is a solidly constructed piece of furniture of lacquered wood, over a foot in length, about three inches high and broad in proportion. In the centre reposes a neat black lacquered box containing cut tobacco, flanked on the right by a fire-pot, of brass, bronze, or earthenware, and on the left by an ash-pot of corresponding material; in front are laid a pair of very long pipes with bamboo stems and brass bowl and

Digitized by Google

mouthpiece. This apparatus is said to have been derived from the *kaubon* (香盆), or incense-tray, the use of which was to gratify an honoured guest's sense of smell with fragrant odours of burnt gums, rare woods and roots of herbs. The fire-pot is the incense burner or *kauro* (香爐), the ash-pot is the *taki-gara-ire*, or 'receptacle for the products of combustion', the tobacco-box is the cover of the silver-wire net-work on which the incense material was consumed over the burning charcoal, and the two pipes have been evolved by gradual steps from the *hibashi* or tongs used for arranging the fire. At Nagasaki the ordinary name for the tobacco-tray at the beginning of this century was *kaubon*, which confirms the theory of its descent from an older group of related utensils. Shiñmi Raujiñ, an author who wrote in the beginning of last century, informs us in the *Yaso Okina mukashi gatari* that fifty years or so before his time tobacco pouches had not yet come much into vogue, and that visitors or guests always smoked their host's tobacco, no matter whether good or bad. The etiquette, too, was different. Until the master of the house made his appearance in the reception room, the visitor did not begin to smoke, though the tobacco tray and its contents were placed before him. When the host came in, after the usual compliments had been exchanged, he invited his visitor to smoke, with the words *tabako maire*. The visitor was expected to decline two or three times, in the same way as a cup of tea or *saké* is refused, entirely as a matter of form, and to press the host to begin. Upon this the host took a sheet or two of paper from the packet which he carried in his bosom, took a pipe in his hand, removed the guard, carefully wiped the pipe with the paper and offered it to his guest, who then accepted it with the usual mark of gratitude by raising it to his forehead, and began to smoke. If the tobacco was good he praised its qualities, and after a puff or two, wiped the mouthpiece with paper and put the pipe down in front of him. The woodcut Pl. VI. from the *Me-zamashi-gusa* represents the scene. There is the square tray between the friends, on the

Digitized by Google

matted floor at the left of the entertainer lies the bundle of paper, on which he has deposited the guard, and he is just in the act of handing the pipe. On taking leave the visitor again wiped the pipe, and replaced it in the tray, the host protesting and begging him to leave it as it was. In former times, continues our author, it was considered a grave breach of good-manners to smoke in the presence of an old person, or of a superior officer. If a young man were invited to smoke, it was proper for him to say that he had not acquired the habit. "The most "notorious knaves, swaggerers, bullies and self-assertors "would not dare to smoke in the presence of their chiefs "*(oyakata)* or elders." The 'guard' was a metal disk with a central hole to fit the pipe-stem, resembling very closely the guard of a Japanese sword. It has been conjectured that the early iron pipes which were carried by the two Clubs at Kiyauto, whose riotous conduct was the cause of one prohibitory edict, were used as weapons, in the same way as the *jitsu-te*, or light iron maces of the police of former days, and that they were fitted with guards to protect the hand.

It was some time before respectable women took to the use of tobacco, but as an anonymous author sarcastically remarks, "women who do not smoke and priests who "keep the prescribed rules of abstinence, are equally "rare." The accompanying woodcut represents a lady of the middle of the seventeenth century, followed by a little servant maid carrying her mistress' long pipe, drawn by the well-known artist Tosa Mitsumasu. It is related of the Dutch that when new-comers arrived at Nagasaki, they were much surprised to see the Japanese women who came into Deshima to entertain them, smoking like men, for that in their own country the women never indulged in the practice, and moreover that men never ventured to smoke in the presence of the other sex. Either these were very early Dutchmen, or there must have been a mistake in the interpretation as regards the second assertion.

The most usual combination of Chinese characters used

Digitized by Google

by the Japanese for writing the word *tabako* is *ensau* (煙草), smoke-weed, with which they first became acquainted through a Chinese medical work entitled Pênts'ao Tungts'üen (本草洞詮) by Ch'ăn Muh (沉穆) written during the reign of the sovereign whose style was Shunche (順治, 1644-1662). Previously they had employed mere transliterations of the three syllables *ta-ba-ko* furnished by Chinese characters, or such elegant synonyms as 'life-lengthening plant' (延命草) and 'long life plant' (長命草), invented by the tobacconists to recommend their goods. One of the transliterations adopted, namely 丹波粉, powder of Tañba, gave rise to a tradition that the leaf first made its appearance in the province of Tañba. Another name, given to it doubtless by its enemies, was *binbausau* (貧報草) 'poverty-plant, because it was feared that the too extensive cultivation of tobacco would diminish the national wealth, and in Riutei Tanehiko's tale of the 'Six-folding Screen,' it is referred to as the *ahau-gusa* or 'fool's herb,' evidently the suggestion of a malicious abstainer.

The Chinese invented a very large number of titles for the tobacco-plant. Expressions such as 'smoke-fire (煙火), 'smoke-blossom' (煙花), 'smoke-leaf' (煙葉)' 'fragrance' (芬) are of obvious meaning. Others are more elegant such as 'gold-thread herb' (金絲草), from the resemblance of the finely cut leaf to the threads of gilt paper used in the woof of brocade. 'Soul-recalling smoke' (返魂煙) is derived from the wonderful power which a single puff has of reviving the energies of the melancholy, wearied and drowsy. It is also called the 'herb of love' (相思草), because those who are addicted to the use of tobacco long for it day and night without ceasing. The epithet 'carried not back' (攜不歸) is applied because hawkers of this narcotic drive so brisk a trade that they usually get rid of their stock before the day is ended, and so have nothing to carry home but the proceeds. The 'herb of amiability' (愛敬草) is a name which it has got on account of the affectionate feelings entertained towards each other by all

Digitized by Google

classes of mankind since its use became general, and from its well-known virtue of soothing the intellect while engaged in the unloosing of some mighty social problem are derived the epithets 'herb of reflection' (思案草) and 'herb of discernment' (分別草). Other names are applied by lovers of the weed out of pure enthusiasm, such as 'joy and happiness' (慶喜), 'constant pleasure' (常樂), 'friend of leisure' (閑友) and 'nourisher of the spirit' (養氣).

Concerning the discovery of the plant Japanese writers recount various legends of Chinese origin. According to one of these "it is the custom in some unknown land inhabited by demons to carry out dying persons into the depths of the forests and there leave them to their fate, and on one occasion it was the daughter of the King of that country who was thus abandoned to a lonely death. Not long afterwards, a man who happened to pass the spot, perceived a most delicious odour, and upon searching for the cause, he found a plant which, being brought near to his nostrils, suffused his whole being with a sensation of purity and freshness. Jumping up in delight, he ran off to the palace and told the marvellous tale. In this way tobacco was discovered." A variation of this story makes the discoverer to be the princess herself, who was revived by the odour of the wonderful plant.

Another legend says that 'there was a Nañbañ woman named Tañbako, who was cured of a cough that had troubled her for many years, by a dose of this plant. It was natural that her name should be given to the remedy." This is a very good example of the way in which myths may originate from attempts at etymology. *Tan* in Chinese may mean 'phlegm' and '*paku*' may be written with two Chinese characters 婆姑 which are both formed by adding the phonetics *pa* and *ku* to the radical 女 'woman.' Hence arose an explanation that some woman must have have been so troubled with phlegm, that she was nicknamed after it, and that her appellation was transferred to the herb from which she had obtained relief.

Digitized by Google

There is also a story of 'a land called Abirika situated somewhere to the east of Japan, where dwelt a beautiful damsel named Tañbako, the object of adoration to an immense number of the youths of that country, whose devotion to her survived her death. It fell out that a certain youth having gone to worship at her tomb, was overtaken by the swift approach of autumn twilight, and was obliged to pass the night there. In the middle of the night a fit of hunger seized him, and on stretching out his hand, behold there was a fragrant herb, a single leaf of which satisfied his craving for food, while a sensation of gentle warmth pervaded his body, and protected him from the ill effects of the morning breeze.' This is also a mere variation of the first legend above given.

The *Ensauki* gives the following list of the merits and demerits of tobacco.

1.—It dispels the vapours and increases the energies.

2.—It is good to produce at the beginning of a feast.

3.—It is a companion in solitude.

4.—It affords an excuse for resting now and then from work as if in order to take breath.

5.—It is a storehouse of reflection, and gives time for the fumes of wrath to disperse.

But on the other hand:

1.—There is a natural tendency to hit people over the head with one's pipe in a fit of anger.

2.—The pipe comes sometimes to be used for arranging the burning charcoal in the brasier.

3.—An inveterate smoker has been known to walk about among the dishes at a feast with his pipe in his mouth.

4.—People knock the ashes out of their pipes while still alight, and forget to extinguish the fire.

5.—Hence clothing and mats are frequently scorched by burning tobacco-ash.

6.—Smokers spit indiscriminately in the braziers, foot-warmers or kitchen fire-places.

7.—Also in the crevices between the thick mats *(tatami)* which cover the floor.

Digitized by Google

8—They rap the pipe violently on the edge of the fire-pot.

9.—They forget to have the ash-pot emptied until it is full to overflowing, and

Lastly, they sometimes put the ash-pot to the use of a nose-paper.

As remedies for the disagreeable effects of excessive smoking, hot water and sugar—liquorice—soup prepared from the paste of fermented beans and barley called *miso*—hot water and salt—and cold water are mentioned. The author of the *Ensauki* recommends from his own experience an infusion of equal parts of *bakumondou* (Ophiopogon japonica), *shiso* seeds (Perilla arguta), *kuwarou nin* (seeds of Tricosanthes japonica), leaves of the loquat (Mespilus japonica) and liquorice (glycyrrhiza glabra), to be strained, and drunk with an ounce of sugar. He omits to give the quantities of the other ingredients.

"Clothes which have been polluted by tobacco-oil can be cleansed with chewed melon-seeds."

"Foreign surgeons are said to mix a decoction of young tobacco leaves with green ointment, and to apply the preparation externally as an anodyne, also to hasten suppuration, stop bleeding and as a vermifuge."

"The decoction of tobacco stalks is useful for destroying the insects which devour the leaves of *awi* (polygonum tinctorium) and other plants. Peasants place bundles of the dried stems in the space between the walls of their cottages and the eaves, to keep out rats and mice. The dried leaves placed in books defend them against their enemies the worms. Paper steeped in a decoction of tobacco may be used as oakum. Small quantities of inspissated tobacco oil, in lumps of the size of a poppy seed, may be applied with advantage from time to time to the eyes in case of amaurosis, and generally have an instantaneous and beneficial effect in cases of dimness of sight and blear-eye."

The medical profession in Japan appear on the whole to have been in favour of smoking in moderation. About the end of the seventeeth century there was much lively

Digitized by Google

discussion of the merits of tobacco. Kaibara opposed its use altogether, as appears from the following extract from his work above-quoted :—"Of articles of food and drink the three potables* *saké*, tea and tobacco are the most appreciated by all degrees of social rank and intelligence. Medical writers tell us that though *saké* has some evil qualities, it is very wholesome when taken in small quantities, nor did the sages of antiquity reject it altogether. Tea has the power of quenching our thirst and driving away troubles. Tobacco alone produces no benefit, but on the contrary does more harm than anything else. It is not worth while to chide the common people for sucking it in, but for gentlemen and 'superior men' to follow after a custom imported from a barbarous country, and to take pleasure in and praise that which harms the body are woeful errors. In the year 1615 the Shiyauguñ published a decree throughout the empire by which the sucking-in of tobacco was forbidden, a most wise law indeed, but it has been left to the present day to lament over the relaxation of this prohibition."

The subject of tobacco in Japan is by no means exhausted in the few notes which I have here put together. The methods of cultivation and preparation for the market, the manufacture of the dried leaf for use, the machinery used in cutting it, the manufacture of pipes, pouches and tobacco-trays, the statistics of production, domestic consumption and foreign export, the different brands esteemed by smokers, are all subjects worthy of notice, but they are foreign to the task which I had set myself, namely to determine the date of the introduction of tobacco into this country, the limits of which question I have already exceeded. I will only touch upon one other point, namely the signboard now in vogue. The paper screens which close the front of a tobacconist's shop are usually adorned with a coloured drawing of a tobacco leaf, and the two Chinese characters 國府 which literally mean "country capital." This sign is to be seen in every part of Japan, and was a mystery to me for some years, until I discovered that the proper way to read the characters

Digitized by Google

was *Kokubu*, and that they form the name of the town in Ohosumi, on the gulf of Kagoshima, which is celebrated for the fine qualities of the tobacco grown in the neighbourhood. Here was the administrative capital of the province of Ohosumi at some remote period before the times of the Shiyauguñ, and *Kokubu*, from being general, has come to be an individual name by a process sufficiently common in the topographical history of all countries. It must not be supposed from the universality of the sign-board that *Kokubu* is able to supply the whole of Japan with its produce, and in fact it might in nearly every case be simply translated "Tobacco sold here." I add a list of native works consulted in collecting materials of this paper.

和漢三才圖繪	
蒿錄	
煙草記	
煙草錄	M.S.
小窓雜筆	M.S.
嬉遊笑覽	M.S.
メザマシ草	.
近代世事談	
和事始	
八十翁昔語	
落穗集	

* In Japanese one is said to 'drink' tobacco; *tabako wo nomu*.

Digitized by Google

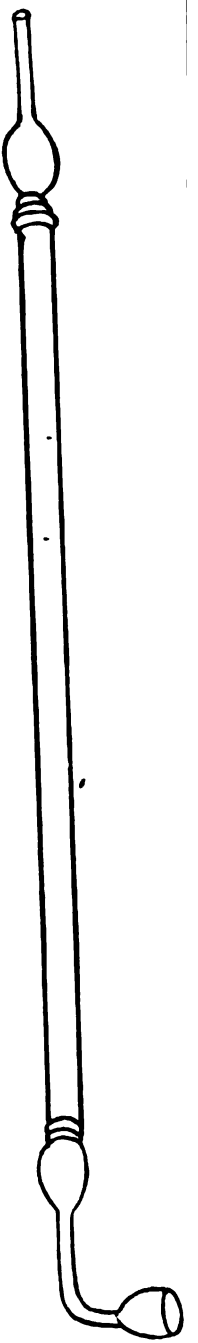
PL. I.

Digitized by Google

PL. 10.

Digitized by Google

PL. II.

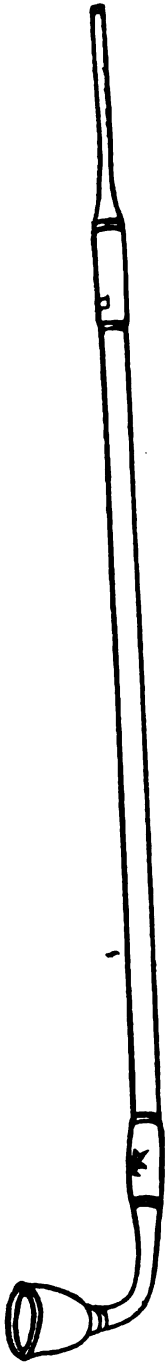


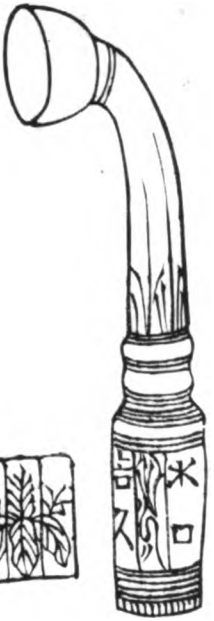
PL. IV.

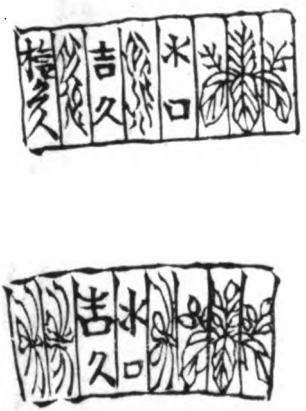
Digitized by Google

PL. II.

Digitized by Google





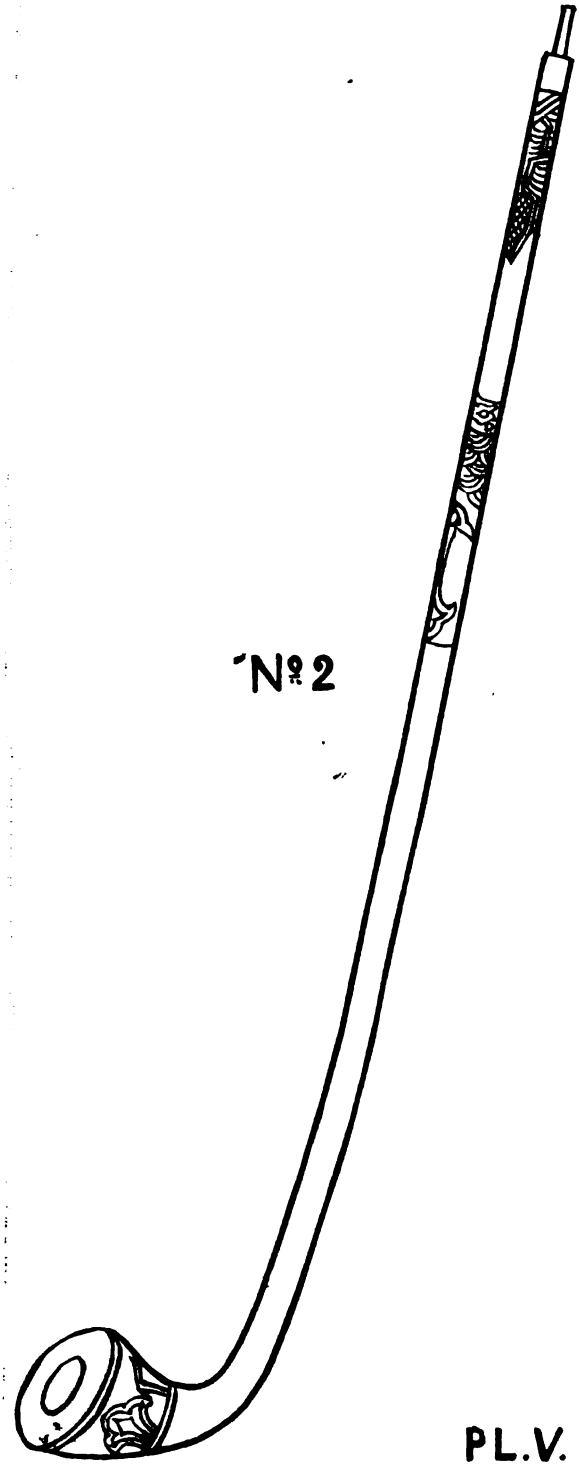


PL. III.

Digitized by Google

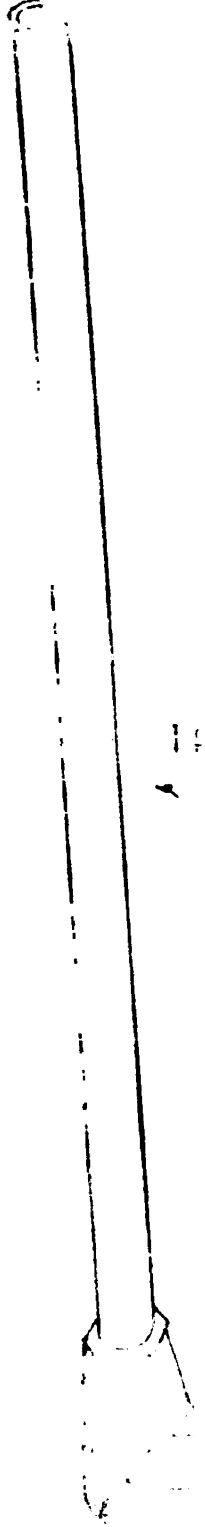
PL. III.

Digitized by Google



Nº2

PL.V.



PL.VI

Digitized by Google

Digitized by Google

PL. VI

Digitized by Google

Digitized by Google

PL. VII.

Digitized by Google

PL. VII.

Digitized by Google

ASIATIC SOCIETY OF JAPAN.

A General Meeting of Society was held at the Grand Hotel, Yokohama, on Saturday the 10th instant, Sir Harry Parkes, President, in the Chair.

The minutes of the last general meeting held in Tôkiô on the 27th ultimo were taken as read.

In the unavoidable absence of Mr. Satow his paper on "The Introduction of Tobacco into Japan" was read by the Recording Secretary.

At its conclusion the President observed that the evidence collected with so much care by Mr. Satow appeared to establish beyond question that tobacco had been introduced into Japan by Europeans. The fact that the plant was only known colloquially in Japan by its European name, afforded in itself a proof of that conclusion, which was scarcely shaken by the legendary notices referred to in the paper. He was not aware, however, that it had yet been satisfactorily shewn that China was wholly indebted to Europeans for tobacco. It was common to suppose that the use of that narcotic which had spread with such wonderful rapidity, and was now universal, had emanated from one spot—Cuba, where, as we know, it was first discovered by Columbus, but in a wild state. The American tobacco or *Nicotiana tobacum* is the species with which we are so familiar, but our information respecting Asiatic tobaccos is much more limited. We know that one of the Asiatic species, the *Nicotiana rustica*, grows in Syria and the North of India, and the celebrated travellers Huc and Gabet have stated that this species is the tobacco of Thibet and Western China. The marked difference in appearance, between the tobacco of Sze-chuen—the principal western province of China,—and that of the centre and littoral, may have been observed by any resident in that country. Meyen speaks of carvings of tobacco pipes resembling those now in use in China being found on very old sculptures, but one must know the age of those sculptures to appreciate the value of this remark. But although China may have had its indigenous tobacco from early times, the American species may also have been introduced into the South through Luzon, as mentioned in the paper, and into the North through Japan and Korea. Dr. Williamson tells us that tobacco entered China through Manchuria, the Manchus receiving it from Japan by way of Korea in about the year 1600. This may partly account for the severity of the Chinese edict of 1638 referred to by Mr. Satow, which was perhaps directed as much against the Manchus, who were the national enemy of that date, as against the plant itself. Dr. Williamson found tobacco growing throughout Manchuria and in marvellous luxuriance, the leaves being of extraordinary size, twenty-four inches long and eight inches broad. The

Digitized by Google

tobacco of Japan does not appear to be of superior quality, perhaps because it is not cultivated or cured with the care bestowed on the plant elsewhere, but full information respecting the growth and capacities of the Japan leaf would be very acceptable. In China and Japan its use is common to all classes and ages of the people, and to both sexes. He would be glad to see Japan tobacco form a larger article of export than it did at present, but he had been told that it was the spongy character of the leaf that gave it its value in Europe, and that it was chiefly used for mixing with stronger qualities, because it facilitated the absorption of water.

Mr. Hall noticed the contradiction between the story of the practice of smoking being brought by Hideyoshi's soldiers from the Korea, and the belief that smoking was introduced into China through the Korea from Japan, and expressed his opinion that the latter was more likely to be correct.

Mr. Hodges observed that it was curious that the prohibition of tobacco by Iyeyasu should synchronise with the celebrated "Counterblast against Tobacco Smoke" issued by James I.

Mr. Hall remarked on this, that both in England and Japan the use of tobacco as a sedative had been first welcomed, then condemned, and at length admitted into a large measure of general favour, and thought that there was room for a question whether opium was not passing through similar phases of public opinion, and being now in the second stage, might not at some future time reach the third stage and come into general use.

Mr. Tsuda remarked that to the best of his knowledge the tobacco cultivated in Japan is specifically identical with the tobacco of America, but that there has been a steady increase in the size of the leaf during the time which it has been a Japanese product.

Dr. Hepburn alluded to the wide spread use of tobacco, and the strange nature of the demand made by the human system in all climates for an article that is probably injurious.

Dr. Eldridge, classing tobacco with many other articles consumed for somewhat similar purposes, such as betel nut, cocoa, tea and coffee, alluded to the fact that tobacco appears to be the favourite article of the class, for wherever introduced it either entirely supplants the indigenous representative of its family, or at the least becomes its formidable rival. The question as to whether such articles as tobacco are injurious, neutral, or positively beneficial to the human system, is still an open one as in the days of King James and Pope Urban. There is high authority for believing that the excessive development of the nervous system of man, above that of other animals, has created a want that is only to be supplied by agents of this class.

Digitized by Google

THE WATER SUPPLY OF TOKIO.

BY

R. W. ATKINSON, B.Sc.,

Professor of Applied Chemistry in the University of Tôkiô.

Read before the Asiatic Society of Japan, on the 24th November, 1877.

It is universally admitted that the water supply of a large town is a matter of the greatest importance to the health and well-being of the community, and it is a subject at the present time occupying the attention of those who are in any way responsible for the good health of the people, and of the people themselves. Experience has proved that many diseases have originated from a contaminated water supply, and though there may be differences of opinion regarding the nature of the action of the water, there are none concerning the fact itself. Instance could be added to instance of cases where a well having become infected in some way, the particular disease has been communicated to all who have drunk of the water. The majority of those who are competent to give an opinion upon the nature of the source of such diseases agree that they are due to the presence of minute organisms, too small to be seen even under the highest powers of the microscope, but capable of becoming developed and of reproducing their kind. The wonderful and rapid spreading of such diseases is one of the strongest arguments in favour of the germ theory of infection, and it is difficult to understand the

Digitized by Google

rapidity of the growth of such diseases unless we compare it with the known rapidity of the development of some of the lower forms of animals and plants. If this be the case it is of the utmost necessity to preserve the water used for drinking purposes perfectly free from contamination with any suspicious matter; and this would appear reasonable so long as there is even a doubt upon the subject. But experience speaks for itself, for in those towns in which the purest water is supplied, epidemics are either unknown or are felt with very much less intensity. Thus it is stated that in Glasgow during the three epidemics of 1832, 1849 and 1854, when the source of the water supply was the polluted river Clyde, the average mortality from cholera was 121·6 per 10,000 people, while in 1866 after the city had been supplied with Loch Katrine water, the mortality was only 1·6 per 10,000 of population. The epidemic which broke out in the village of Lausen, near Bâsle, Switzerland, in 1872, has proved that infected water may traverse a distance of more than a mile through earth without losing its power of causing disease. And this is not to be wondered at if we consider the germs of disease to be the eggs of low forms of animals or the spores of certain plants, whereas, if they consisted of organic, but not living substances, the probability is that they would be completely oxidized. Dr. Frankland, in a paper read before the Chemical Society, London, in 1868, gave a very striking illustration of this, which will best be given in his own words. "If the shell of an egg were broken and its contents beaten up with the water and thrown into the Thames at Oxford, the albumen would probably be entirely converted into mineral compounds before it reached Teddington; but no such destruction of the nitrogenous organic matter would ensue if the egg were carried down the stream unbroken for the same distance, the egg would even retain its vitality under circumstances which would break up and destroy dead or unorganized organic matter. Now, excrementitious matters certainly sometimes, if not always, contain the germs or ova of organized beings; and as many of these can doubtless

Digitized by Google

retain their vitality for a long time in water, it follows that they can resist the oxidizing influences which destroy the excrementitious matter associated with them." The legitimate deduction from this is that a water to which infected matter has at any time gained access should be rejected for drinking purposes, no matter how much it may subsequently have been exposed to the air. How is it to be known whether a water is contaminated or not? No means are known at present of stating positively whether a water contains the germs of disease without physiological experiments which are undesirable, but from the constant association of germs with excrementitious matter we have a means of knowing whether a water is dangerous or not. Any water which can be proved to have previously been charged with sewage, ought to be rejected whether organic matter be present to any large extent or not at the time of examination. Chemical analysis supplies the means of knowing the previous history of the water, and though it will not say whether a water is disease-infected or not, it gives us the means of ascertaining whether a water is pure and undefiled or dangerous. For sanitary purposes it is not necessary to know the nature and amount of all the constituents of a water, but it is necessary to have some means of knowing the amount, relative or absolute, of fresh organic matter, as well as the amount of those mineral substances which result from the oxidation of organic matter. Excrementitious organic matter contains carbon, hydrogen, oxygen, and nitrogen and the products of its oxidization and change are water, carbonic acid, ammonia, and nitric and nitrous acids. Of these the only bodies available for the purpose of analysis are ammonia, nitric and nitrous acids. If we find considerable quantities of these substances in any natural water we know certainly that they have been derived from sewage matter. It must, however, be remembered that rain water always contains small quantities of these bodies, and therefore in estimating the value of a water, the average amount present in rain water has to be deducted from the amount found in the water under

Digitized by Google

examination. Chemical analysis can also show the relative amount of present organic matter in different waters, and this is a point of great importance, for it shows how recent has been the contamination with sewage matter.

The accompanying tables give the results of analyses made in the Chemical Laboratory of the University of Tôkiô by Messrs. Ishimatsu, Takamatsu, and Takayama, senior students, under my direction. The sample of water from the districts supplied by the Kanda were collected on the same day, except the two first, and those from the district supplied by the Tama water were also collected on one day. The specimens of surface waters were collected on different days.

It will be convenient here to explain the meaning of the numbers given in the various columns.

1. *Solids:*—Obtained by evaporating 100 cubic centimetres of the water to dryness over the water-bath, great care being taken to guard against the admission of any particles of dust, and drying at 110° C. This includes besides mineral matter, such organic matter as has not been expelled during the evaporation.

2. *Chlorine:*—Estimated by means of a standard solution of argentic nitrate. The presence of chlorine is partly owing to spray which is blown by the winds from the bay of Yedo into the interior, and when in large quantity, may indicate contamination with sewage. Its determination is very important.

3. *Free Ammonia:*—Determined by distillation and estimation in the distillate by means of Nessler's re-agent. All rain water contains free ammonia, but only in small quantities; when present in large amount in water it usually indicates the presence of decomposing urea, and so points to sewage contamination. The presence of a considerable amount of chlorine in a water, together with a large amount of ammonia, will usually be sufficient to condemn that water on account of recent contact with sewage.

4. *Albumenoid Ammonia:*—Is determined by boiling with an alkaline solution of potassic permanganate, and

Digitized by Google

estimating the ammonia in the distillate as in (3). All nitrogenous substances do not give off the whole of their nitrogen as ammonia, but that is a matter of little moment, since all that is required is to get comparative results. Urea, although giving off no ammonia when treated as above, is recognised with certainty by the presence of chlorine with which it is always associated in sewage. Although, therefore, the numbers obtained in this determination do not represent the whole of the nitrogen contained in the organic substances present in the water, yet when it is found that one water yields a large quantity of ammonia whilst another water yields only a small quantity, when treated with alkaline permanganate the inference is justly drawn that the former contains a larger quantity of nitrogenous organic matter than the latter. Before making this determination the free ammonia is, of course, expelled.

5.—*Oxidized Nitrogen:* Determined by first expelling the free ammonia present and treating the residual water with caustic potash and powdered zinc. The nitrates and nitrites are reduced to ammonia, and the amount of ammonia liberated is ascertained as before.

When an organic substance containing nitrogen is exposed to slow oxidation, especially in presence of basic substances, the nitrogen forms nitrous and nitric acids, and thus the determination of the nitrogen existing in a water in this form is a measure of the amount of nitrogenous organic matter which has previously been contained in the water and has undergone oxidation. In some cases it may be derived from soil containing animal organic matter in a state of oxidation, through which the water has passed, but in either case it tells the past history of the water. Although the presence of nitrates and nitrites in a water is not of itself injurious, it is a sign that the water has passed through conditions which might permit it to become infected with the germs of disease, and therefore when found in any quantity in water, such water ought not to be used for drinking purposes at any time, but especial care should be taken during the prevalence of an epidemic. At such times it is the duty of an enlightened government to forbid

Digitized by Google

the use of such water, and to supply the district with pure water at the public expense.

6.—*Total Mineral Nitrogen:* By this is meant the amount of nitrogen existing in the water after deducting that contained in average rain water, in the form of ammonia and oxidized nitrogen. It does not include the "albumenoid ammonia." It, therefore, expresses the amount of that element which has been taken up by the water in passing through impure soil, or by having come into contact in some other way with animal excreta. This number, therefore, expresses the actual amount of contamination with which the water at one time or another has been in contact. Dr. Frankland, in his reports on the water supplied by the eight London water Companies made for the Registrar General, has introduced the term "Previous Sewage Contamination" to express the quality of a drinking water, and this number will be found in column

7.—It is calculated in the following way :—Taking the amount of combined nitrogen in 1,000,000 parts of rain water as =0.32 parts, this number is deducted from the sum of the nitrogen present in the form of free ammonia and oxidized nitrogen. Then, as average filtered London sewage has been found to contain 100 parts of combined nitrogen in 1,000,000 parts, (=1 in 10,000 parts) we can express the amount of sewage with which the water has been in contact by the following formula—10,000 ($N + N^1 - r$), when N expresses the amount of nitrogen existing in the form of ammonia, and N^1 that present in the oxidized state, and r is the total amount of combined nitrogen in rain water.

It will be understood from what has been said under the head of oxidized nitrogen, that this number does not express the amount of organic matter actually present in the water, but only that which has been completely oxidized, and as there are many causes which lead to a removal of the nitrates and nitrites from a water, such as the presence of growing plants, etc., the number so obtained can only be regarded as the minimum amount of impurity.

Digitized by Google

In order to form an opinion as to the amount of present impurity, we must look to the column headed albumenoid ammonia, and the number there given will show whether the contamination is recent or old.

8.—*Calcium Salts.* This indicates the amount of carbonate of calcium or other soap destroying salts contained in the water.

Tôkiô is supplied with water from three different sources. The city proper, that is the part bounded by the Sumidagawa and the bay of Yedo on the one side, and by a line extending from Kanasugi-bashi, Shiba, to Toranomon, thence by the outer moat of the castle and, the Kandagawa as far as Riogoku-bashi, is supplied by means of pipes which bring water from two sources, and, except in the elevated districts of Bancho and Suruga-dai, surface water is not used. The rest of Tôkiô outside the castle walls, and the districts of Honjo* and Fukugawa on the other side of the river, use only surface water. The two kinds of water which are distributed to the different parts of the city are derived from the Tamagawa, and from the Kanda. The point at which the water is taken off from the Tamagawa is about 12 *ri* from Tôkiô, and water is conveyed to the city in an open canal to Yotsuya, where it enters the city pipe and discharges at Reiganjima. It supplies the whole of the city south of a line drawn from Yotsuya to Hitotsu-bashi, from this to Wadagura-go-mon thence to Kaji-bashi, and from this to O-hashi, following the canal north of Hachobori and Reiganjima.

The source of the Kanda water is about 4 *ri* from the Dai Gaku, and consists of three ponds, but a branch canal of the Tamagawa joins it on the way, so that the two waters are mixed in about equal quantities. It enters the city pipe at Sekiguchi, Koishikawa, and discharges at Riogoku-bashi and Kio-bashi. The remainder of the city, with the exception of Bancho and Surugadai, which use surface water, are supplied with Kanda water. I am indebted to Mr. Matsumoto, Engineer to the Tokio *Fu*, for the above

* Honjo is to some extent supplied with Tamagawa water brought over in boats from Reiganjima.

Digitized by Google

particulars, and also for information respecting the best points from which to take samples of the water of the two supplies.

Tamagawa Water. (Table I):—The water from Koji-machi may be considered as the raw material which is used to supply the district, and from the results of analysis it will be seen to be of good quality and well fitted to supply the wants of a large town. Although it is not absolutely pure, the amount of impurity is so small that it proves the previous contact with sewage to have been of very slight extent. And the quality of the waters taken from Toranomon, Kanasugi-bashi (Shiba), and Hachobori approach it in purity, though the former appears to have been slightly contaminated by some local impurity. The two remaining specimens of this water, however, taken from Tsukiji and Reiganjima contain very considerable amounts of impurity, as is indicated by the large amount of chlorine and free ammonia. The chlorine is probably derived in part from the water of the bay, but that the increase is not wholly due to this circumstance, is shown by the presence of a large amount of ammonia, which can only have been derived from the decomposition of animal matter. In these low lying districts where the flow of the water is smaller, there must be a much greater tendency for impurities to leak in through the joints of the pipes than in the higher districts, and in this way the greater amount of impurity may be accounted for. But, the pipes being made of wood, in time become saturated with water and a process of diffusion must occur between the water in the pipe and the impure liquids outside. This diffusion will take place throughout the whole system of pipes, but will be much more marked in those districts towards the end of the supply where the flow is more sluggish.

Kanda Water. (Table II):—The specimens taken at different points of the district supplied from this source show a progressive increase of impurity as the distance from the source is greater. At Sekiguchi (Koishikawa) where it first enters the city pipes, it equals in purity the water derived from the Tamagawa, and if its purity could be

Digitized by Google

Sample of wa	Depth in feet.
Koji-machi, 5-chôm	
Kotahira-chô, (To	
Hamamatsu-chô, (	
Odawara-chô, (T No. 7.....	
Matsuya-chô, (Ho chôme, No. 2	
Shio-chô, (Reiganj	
Koishi-kawa, Kanatomi-chô, No. 22.. (From A. Hamao, Esq.)	24
Ichiban-chô, No. 49..... (From K. Fukuda, Esq.)	30
Suruga-dai, Nisshi Kôbai-chô, No. 12. (From Prof. Jewett.)	45
Kaga yashiki Hospital, Hongô.....	38
Asakusa, Kita Kiyoji-machi, No. 15...	3½
Mukôjima, Komme-mura, No. 64... (From H. Wuriu, Esq.)	3
Honjo, Koidzumi-chô, No. 22.....	9
Fukagawa, Ishizaki-chô, No. 32.....	10

TABLE IV.—EXAMPLES

Sample of wat	S
Sekiguchi (Koishi-k	
Sarugaku-chô, 3-ch	
Hon-chô, 3-chôme,	
Tori Abura-chô, N	
Minami Temma-c 3-chôme, No	
Konni-chô, 3-chôm	
Kakigara-chô, 3-ch	
Yonezawa-chô (1 3-chôme, No.	
Thames Water as delivered in London	3
New River Co.'s Water.....	3
East London Co..... ...	3
Kent Co.....	4
Glasgow Water.....	
Manchester Water	
Well water near Preston, Lancashire.	5

Digitized by Google

III.—SURFACE WATERS, TOKIO.

PARTS IN 1,000,000 OF WATER.							
Solids.	Chlorine.	Ammonia.		Oxidized Nitrogen.	Total Mineral Nitrogen.	Previous sewage contamination.	Calcium Salts.
		Free.	Albuminoid.				
347·5	4·1	·04	·065	4·755	4·475	44750	76·5
435	83·0	·026	·064	7·204	6·910	69100	131·0
750	126·7	·118	·093	33·356	33·154	331540	141
217·5	37·0	·025	·031	3·62	3·325	33250	54
411·5	54·5	·076	·031	6·245	6·001	60010	115
193.5	5·5	·024	·073	1·208	·912	9120	22
307·5	37·5	·645	·175	1·026	1·351	13510	71·5
595·5	220·5	·439	·333	1·166	1·285	12850	85·5

OF OTHER DRINKING WATERS FOR COMPARISON.

PARTS IN 1,000,000 OF WATER.							
olids.	Chlorine.	Ammonia.		Oxidized Nitrogen.	Total Mineral Nitrogen.	Previous sewage contamination.	Calcium Salts.
		Free.	Albuminoid.				
09·4	17	·015	·105	3·46	3·155	31550	—
02	15·7	·012	·070	3·61	3·502	33020	—
60	—	·017	·103	3·07	2·767	27670	—
48	—	·01	·02	4·08	3·770	37700	—
32·8	7·6	·00	·08	·31	·00	0	—
68	9	·01	·06	·01	·00	0	—
44	—	·03	—	24·66	24·36	243600	—

Digitized by Google

preserved, no exception could be taken to the water supplied to the city of Tôkiô.

But the results of analysis show that this is not the case. It is very interesting to observe how nearly regular the increase is, starting from Koishikawa. The three first samples are very pure, containing small amounts only of solid matter, chlorine, ammonia and oxidized nitrogen, whilst those samples taken from the centre of the populous district supplied with this water present much larger quantities of each of these constituents. The two last specimens taken from near the end of the supply, at Kakigara-chô, and Yonezawa-chô (Riogoku-bashi), have evidently been very largely contaminated with organic matter, the amount of albumenoid ammonia being very large, whilst the evidence of previous pollution is also very strong. This comparison of these various waters, therefore, confirms the remarks made in connection with the Tamagawa water. It is quite evident that the use of wooden pipes is not sufficient to preserve the quality of the water, and as such pipes are proved capable of admitting organic contamination into the water supply, there is no reason to suppose that they will exert any especial exclusive action on the disease germs which may surround them. Imagine a few isolated cases of any zymotic disease breaking out in any part of this thickly inhabited district, and consider how impossible it is to prevent some of the excreta of such patients finding its way into the soil and so into the water supply, and it will be evident that such germs will spread like wildfire through the whole of the district supplied subsequently by such water. In such a case the water, indeed, acts as a carrièr of the disease, and its use is even worse than that of the water from surface wells, which at most supply only a few houses. The natural inference to be drawn from these analyses is that, the water being good to start with, proper means should be taken to preserve its purity by the adoption of some system which will prevent the introduction of impurity from the soil, that is, by replacing the wooden pipes by others made of some impervious material.

Digitized by Google

Table IV. is given, compiled from the results published by Dr. Frankland in his paper read before the Chemical Society in 1869, and from analyses given by Professor Wanklyn in his treatise on water analysis, in order that a comparison may be instituted between the water used in Tôkiô and that supplied to London, and some other places in England. It will be seen that the Tôkiô water at its source is greatly superior to any of the London waters, but that it is inferior to the water supplied to Manchester and Glasgow. The London supply is, however, confessedly imperfect, and agitation is at the present time being made for its replacement by water from some purer source. The waters of Manchester and Glasgow are extremely pure, being derived from uncontaminated sources and not being permitted to come near any impurity. The character of these waters, also, is preserved by their being transmitted through impervious pipes, and thus the water taken from every part of the system will have the same composition.

Surface Waters:—(Table III). It is, however, in the surface water that we may expect to find the largest amount of impurity, for, from its origin it passes through soil charged with all sorts of organic matter, and collects in some basin, from which it is obtained by wells sunk through the earth till they reach the level of the water. It will be obvious that the deeper the water sinks the greater will be the amount of impurity taken up by it, other conditions remaining the same, and this is for the most part borne out by the examinations made of the surface water from different parts of Tôkiô. In all except that from Mukojima the number expressing the "previous sewage contamination" is very high, while the amount of "albumenoid ammonia" is comparatively small, not greater than that found in most specimens of London water, except in the waters from Honjo and Fukagawa. The use of the latter water was, I believe, condemned by the Tôkiô *Fu*, during the prevalence of cholera in that district, but without actually closing the wells it would be difficult to ensue perfect obedience to such an order.

Digitized by Google

The result of the analysis of these two waters shows that there existed good reasons for closing the wells of the districts, the amount of organic matter actually present being quite abnormal. The large quantity of chlorine contained in the water from Fukugawa may have been derived from contact with sea water, but the presence of ammonia and the large amount of solid residue suffice to condemn its use for drinking purposes. It will, also, be noticed here that the numbers expressing the "previous pollution" of the last two waters are comparatively small, showing that the contamination is of more recent date than that of the other wells, the time which has elapsed since the pollution, not having been sufficient to effect the oxidation of the nitrogenous animal matter.

The purest of these surface waters is, undoubtedly, that from Mukojima, which shows very little more impurity than is contained in the Tamagawa or Kanda waters at their sources. The water is obtained here by digging a hole into the ground and sinking a bamboo pipe, when the water rises to within a short distance from the ground. It is thus a species of Artesian well, and as its resevoir is probably situated some considerable distance below the surface, to which sewage has less opportunity of gaining access, its high degree of purity is explained.

The most impure water I have examined is that collected from Surugadai, and as the results were so extraordinary, a second sample from the same well was taken about ten days after the first sample, and analyzed with similar results. There seems to be no doubt, therefore, that the results obtained express the ordinary quality of the water used in this part. The water was 45 feet below the level of the ground, and the resevoir would thus seem to be nearly at the same level as the Kanda-gawa.* On account of its great depth and from the populous character of the neighbourhood, it is reasonable to suppose that it receives the drainings from all the houses on the hill, and in this way

* The depth of the water in wells in various parts of Suruga-dai was measured, and it was found that, roughly, the depth was greatest at the highest points of the hill, affording probable evidence that the whole hill is supplied with the same water.

Digitized by Google

its unwholesomeness would be fully accounted for. It is scarcely necessary to say that its continued use as a drinking water is exceedingly dangerous, and it should be replaced by the purer Kanda† water which is within easy reach.

I regret that there has been no opportunity of examining samples of surface waters from a greater number of localities, but they would probably nearly all show similar characters. The results of these analyses may be thus expressed :—

1°.—The waters supplied to the city are originally good, but become deteriorated by passage through wooden pipes.

2°.—Most of the surface waters are dangerous, and some are exceptionally bad.

---

† It most be borne in mind that the Kanda which supplies the drinking water differs from the Kanda-gawa.

Digitized by Google

ASIATIC SOCIETY OF JAPAN.

A General Meeting of the Asiatic Society was held at the Tôkiô Dai-gaku on Saturday, 24th November, Sir Harry S. Parkes, President in the chair.

The minutes of the previous meeting were taken as read.

Mr. Ayrton announced on behalf of the Council, that it had been proposed to alter rule 25, by which it was provided that 10 copies of a paper should be given to the author, and in accordance with standing regulations Dr. Divers, Mr. Chaplin and Dr. Faulds were appointed a committee to confer with the Council on that subject. The election of the following gentlemen as new members was then announced, Dr. Divers; Mr. Terry; Captain James.

Dr. Faulds remarked that since his note at the last meeting on the waxy bodies which he considered to be the undeveloped female of an aphis, he had discovered a winged aphis which was very probably the sought-for male.

Mr. Atkinson then read a paper upon the "Water Supply of Tôkiô."

At its conclusion Mr. Chaplin said:—That the paper which had been read was of great interest to the people of Tôkiô just at this time; and it was valuable to engineers the world over, because it showed that wooden pipes were unsafe to carry water for domestic purposes. It had been known for a long time that metal pipes were liable to injure the water running through them; but this was the first investigation, which he had seen, which seemed to prove that wooden pipes had the same failing. He did not think it probable that there was any flow of contaminated water into the pipes through leaks; because the pipes were carefully made and generally the head of the water inside the pipes was greater than the head of the water outside. The water works of Tôkiô were, on many accounts, remarkable. When they were built, they were probably the most extensive works in the world. The first works for supplying the people of Tôkiô with water were made to carry water from a hill near Akasaka to a section which had been formed by filling in a marsh on the shore of the bay; probably this was the place now called Tsukiji. When these works were built the city was very different from the present city. Old maps show Asakusa as a separate village and the place where the Tôkiô Dai-gaku is, as a marsh. As the city extended, the supply of water was obtained from other streams flowing through the city, but all these works had now disappeared. The Kanda water-works were probably built about 1650. They were supplied by three small ponds which lie west of the city. These ponds were shallow and nearly filled with water-plants. The people living near them said they were supplied by springs, and that the water was generally cold in summer. The greater part of the water in the Kanda water-

Digitized by Google

works came from a canal which connected them with the Tama canals. The Tama water-works were built in 1653. They brought the water from the Tama river at a point where that river left the hills. At this place the water seemed to be very pure and there was an abundance of it. In mid-summer the canal took nearly all the apparent flow of the river, but, as the bed was formed of washed gravel, and as there were always pools of clear water below the dam, it was probable that a large part of the water ran below the top of the gravel. At this point, Hamura, there was a low dam across the river, and the banks were protected in such a way as to show that during high water the river was a very powerful stream. The canal was almost wholly in excavation,—in fact there was but one embankment, which was near the limits of Tôkiô. At one place the canal ran through a slight depression in the surface of the plain, and the water now filled this. When the canal was built it was believed that the cherry tree had the power of abstracting poison from water; so, many trees were planted around this artificial lake. These trees were still standing. All along the canal were villages which drew their supply of water from the canal, and in many places were side canals which drive flour mills. It had been found that in summer 150,000,000 gallons of water left Hamura daily; but of this quantity only about one-eighth entered Tôkiô through the Tama water-works. How much came through the Kanda water-works, he did not know; probably as much more. Considering the fact that when these canals were made the Japanese had no shovels or carts, in fact none of the tools of the modern navvy, and that all the earth had to be carried out of the canal either in baskets or on mats, their construction must certainly be considered wonderful. A rough calculation showed that more earth was moved in building them than in building the railroad from Tôkiô to Yokohama. The records showed that the cost of building the Tama water canal was only 9,000 *yen*, of which the Shôgun paid 8,000 and the engineers raised 1,000. The cost per cubic yard must have been less than one *sen*, or about a twentieth of what it would cost now. The engineers of the Tama canal were two head men of the village of Hamura. They received as a reward a pension of 200 *koku* of rice. In the city the water was distributed through wooden pipes. The large pipes were made of several planks, two and a half or three inches thick, spiked together. The small ones were made of square timbers, which were hollowed out so as to form three sides of the pipes, and on these planks were nailed to form the fourth side. All the joints were caulked with cedar bark. The water was not carried into the houses but ran into wells. Honjo was supplied with water by boats, which obtained it from the pipes in the other parts of the city and from the rivers at points above tide-water. The cost per gallon was about one *rin*.

The length of the Tama canal from Hamura to Toranomon was 28.9 miles; of the Kanda canal 14 miles. Connected with the Tama canal were 30.3 miles of pipes and with the

Digitized by Google

Kanda canal were 29.1 miles. These pipes supply 8,000 wells. The engineer of the Tôkiô *Fu* had designed works in modern style to supply, not only the parts which were now supplied, but also the parts lying beyond the Sumida river and south of the castle. He proposed building reservoirs in the city and raising water to the high points by steam power. The city was spread over so much ground that the cost must be unusually large. Mr. Atkinson's paper showed the necessity of improving and extending the present system, and, if no other plan was possible, it was doubtless the duty of the authorities to go to the great expense of carrying out the engineer's plan.

Dr. Faulds said he had to express his thanks for Mr. Atkinson's valuable researches, the accuracy of which on some points he believed he was able to confirm from observations made in another field of study and by quite different methods. He had shown that in Odawara-chô and in Suruga-dai districts the water was exceptionally impure. With the first named district he was exceedingly familiar, and medical experience had not only led him to form independently the same opinion as Mr. Atkinson, in regard to the organic impurities of the water, but several groups of cases had been carefully traced up to an evident origination from particular wells in that district. He was not quite prepared on the evidence before the meeting to accept as final the very ingenious and suggestive explanation proposed by Mr. Atkinson, for the ascertained fact of the increasing impurity of the water supply as it neared its final outlet. Where actual holes did not exist he questioned if diffusion through the water-logged sides of the wooden main would suffice to explain altogether the extensive contamination that seemed to take place. This part of the investigation seemed still to require experimental verification, but meanwhile he would venture to suggest a very much simpler explanation. The wells, as he had seen from examination of certain apparently poisoned ones, were supplied by a bamboo pipe leading off from the main which was always pervious and immersed in the water of the well. Now if any impurity should enter the well, it seemed to him that part of it would naturally regurgitate by the open supply pipe into the main, and thence be distributed in a highly scientific manner, though perhaps too diluted to be markedly injurious, over the remaining area of supply. An example of the danger thus arising may be interesting. Two people living in Odawara district, near the outlet of that supply which Mr. Atkinson showed to become progressively impure, sickened suddenly of cholera and died in a few hours. He found that both had drunk out of one well and out of that well alone. This well was connected with the main in the manner he had described. Its walls were decayed and admitted visibly of leakage. Separated by a few inches only was a deep trench filled with putrid stagnant filth from the houses, which had not, an official told him, been cleaned for years. The lining of this gutter was of decayed wood also. A few feet along, and *leaking visibly* into the gutter, was a public

Digitized by Google

urinal and privy—not cleaner than the average ones in the slums of Tôkiô. Some of the filth from that place must almost certainly have got into the well, and from thence he thought into the main again. That this water, after all, was not to every one absolutely poisonous, was shown by the fact that the minor official accompanying him, who differed somewhat from his estimate of the safety of this arrangement, took a good draught of this beverage and he was happy to say survived. The danger, on the other hand, might be shown from the fact that the adjoining public privy had a very clear history of infection from choleraic discharges, and during an epidemic few of these places can escape infection. Cholera, however, is not the only disease which may thus be propagated. Diarrhœa, dysentery and typhoid are persistently prevalent in this district, and these have a close relation generally to the water supply Further, typhoid cases seemed to him clearly to have originated by contaminated water from particular wells in this part of the city. Mr. Atkinson's examination of the water at Suruga-dai had yielded results quite as valuable from a medical point of view, and results which to most were quite unlooked for and surprising. He might state, however, that an outbreak of a disease closely related to diphtheria in many of its features seemed to him unmistakeably to originate in Suruga-dai. It spread thence with a pretty clearly connected history of contagion from individual to individual over a large part of Tôkiô; Japanese and foreigners were equally and in several cases fatally affected. It was traced up to Suruga-dai, and with the utmost efforts could not be traced beyond there. As cases are even now appearing of a similar kind, he had had his attention directed very closely to this spot, and had inspected roughly one or two of the wells. The water did not appear very wholesome, certainly, but his doubts were somewhat stifled by the general impression prevailing everywhere that the water in such a situation must be better than in other parts of Tôkiô. The facts laid before the society to night, and arrived at without any knowledge of those he now mentioned, threw back a flood of light on this outbreak. He was aware that this disease had been called diphtheria, but as the characteristic membrane of that disease was wanting in all the cases seen by himself and by Japanese doctors who had spoken to him on the subject, he still hesitated to apply this term to these cases. It was a disease, however, he had no doubt, depending on a microscopic living and growing poison, which could be transferred from one favourable soil to another by water, although it might likely enough avail itself also of other means of diffusion. On one point not alluded to in the paper he would like to make an enquiry. He had been frequently struck with the prevalence of symptoms amongst the Japanese which strongly resemble, and even in some cases exactly simulate, those produced in chronic copper poisoning. Had Mr. Atkinson tested for copper? Of course, if these symptoms are due to copper, that might perhaps come from the vessels used for cooking, etc, which are frequently made from that metal. Such an accident happened to himself when pass-

Digitized by Google

ing through Kiôto. In a well known Japanese hotel much frequented by foreigners and well conducted, some soup was presented to him so strongly impregnated with copper salts that it could not be used. It would be interesting, however, to know whether even in the water-supply there may not be a faint trace of copper; perhaps it might be influenced by the rain-fall at the sources from which the water is drawn. He thought Mr. Atkinson deserved the thanks of all for bringing his conclusions so clearly before the Society. Nothing could illustrate the importance of a good, unpolluted water supply so well as the case of London during the cholera epidemic of 1854, and that of a poisoned well in Rochester (U.S.) last year. In a certain district of London two water companies supplied alongside of each other families living under precisely the same conditions, except that the water supplied to the one portion was derived from a higher reach of the Thames than the other and was much freer from sewage. Amongst these people the mortality from cholera was very slight. The water of the other company, drawn from a source near the city, was therefore impure from entrance of sewage. The families who used this water suffered to an extraordinary degree, and only one explanation seems available. The case of Rochester was similar but only one particular well was suspected. The illnesses among families who partook of its water were very numerous, while those living in the same neighbourhood, but using other wells, almost entirely escaped. It was now believed that many of those diseases which are so far spreading and fatal are due to the growth and diffusion of living seeds or germs, far too minute in many cases to be seen by any microscopic power we have yet been able to obtain, but some of them have been seen and others may yet be. It was, meanwhile, a safe and practical conclusion that water which was contaminated with filthy and infectious matter, might serve to transport far and wide these minute living sources of disease and death.

Dr. Divers wished to congratulate the author of the paper on the opportunity that had been afforded him for making a comprehensive investigation into the nature of the water supply of the city, and on the thoroughness with which he had availed himself of it. His own experience had been very limited, but he might mention that the results which he had obtained with the water at Tora-no-mon supplied to the Engineering College, agreed with those of Mr. Atkinson—the quantities of chlorides, ammonia, and nitrites being inconsiderable, and impurities readily oxidizable by acid permanganate solution absent. The non-scientific public were apt to be incredulous as to the significance of such small quantities of impurities as the chemist found in potable waters, but the experience of medical men had placed it beyond reasonable doubt. Respecting the quantities of nitrates and nitrites in waters, a statement had lately been made in England by Professor Lunge to the effect that by the method usually followed, and just described by Mr. Atkinson to

Digitized by Google

the meeting, the amounts of these substances were under-estimated. Water was sometimes found, in summer time especially, to acquire an unpleasant taste, which excited distrust as to its wholesomeness, but this taste was often due only to the presence of minute quantities of substances derived from vegetable mould, and had not the evil significance attached to evidence of animal contamination of the water. He thought it quite possible that the water supplied through wooden pipes might become contaminated in its course by diffusion, through the joints of the pipes, if not through the substance of the wood. Although not connected with the subject of water-supply, still as bearing upon the dissemination of disease, he might point out the possible dangers of the careless and offensive method of portage of ordure from the city to the country districts. Direct experiments with chemical solutions in a state of effervescence had proved, that during the putrefaction of liquid ordure, particles must become suspended in the air and remain so for a considerable time, and thus be liable to be carried to great distances by the movements of the atmosphere.

After some observations from Mr. Ayrton and Dr. Veeder:

Mr. Atkinson briefly replied to some of the remarks made by previous speakers. He had attempted to gain some information respecting the parts of Tôkiô considered to be healthy or unhealthy, but had failed to get anything very definite. It was generally agreed that the districts of Yotsuya and Koishikawa were healthy, as well as Suruga-dai, whilst Honjo was considered to be unhealthy. That Suruga-dai should be a healthy district was contrary to the conclusions drawn from the analyses of the water, and Mr. Atkinson, therefore, felt gratified that his results were corroborated by Dr. Faulds, especially as his opinion was derived from utterly different observations. With respect to the pollution of the water being caused by infiltration into the wells and not by diffusion through the pipes, Mr. Atkinson considered that although regurgitation would probably occur, yet its extent would scarcely be sufficiently great to cause any very marked increase of impurity, and pointed again to the circumstance that the amount of impurity increased as the distance traversed by the water was greater, whereas, if the contamination took place in the well itself, the distribution would be irregular.

The President closed the meeting by remarking on the deep interest of the subject, and the useful manner in which it had been treated by Mr. Atkinson and those members who had joined in the discussion. The former had clearly demonstrated in his paper how important it was to the health of the people of this large city, that they should be furnished with better water than that which they now drink, while Mr. Chaplin had given most interesting details respecting the history and working of the present water system of Tôkiô. He had also shewn that an ample supply of the purest water was within easy reach, and that it was only owing to

Digitized by Google

imperfect mechanical arrangements that such water was not conveyed from that fine stream—the Tamagawa—to the doors of the people entirely free from contamination. Allusion had been made in the paper to the new water-works of Glasgow, which were believed to be the most successful enterprise of the kind yet executed in the United Kingdom. These works had been laid out on a scale which would admit of a daily supply of fifty millions of gallons being furnished to a population of about 450,000, though twenty-six millions of gallons had been found sufficient to meet their wants. Mr. Chaplin had informed us that one hundred and fifty millions of gallons were drawn off daily from the Tamagawa, a fifth of which, however, was only brought to Tôkiô, and supplied to 350,000 people, or less than half of the population of the city. It would be seen, therefore, that the present supply from the Tamagawa, having regard to the number of people who used it, was on a scale scarcely inferior to that of Glasgow, although the large manufactories of that city created a particular demand that was not known at Tôkiô. As the supply from the Tamagawa could be increased to five times its present amount there was no question as to its sufficiency, and the only difficulty which lay in the way of placing Tôkiô in as good a position, probably, as any other city in the world, appeared to be the cost of substituting iron pipes for the existing defective wooden ducts. The estimate of a million and a half of dollars was a serious outlay, however, for the Japanese Government to have to face, and if the Committee of members who had undertaken to pursue the investigation of the subject could suggest any means for reducing this estimate without detriment to the quality of the water, they would render an important service to the Government and to the people of Tôkiô. He was glad that such a practical subject had been brought before the Society, and he particularly recommended it to the attention of the members.

Dr. Faulds hoped that experiments might be carried out to put to the test Mr. Atkinson's theory of contamination by diffusion, and he suggested that Mr. Atkinson, Dr. Divers, and Mr. Chaplin should be asked to give the subject their attention.

The President thought the suggestion a good one, and proposed that Dr. Faulds be added to the number, and that the Committee have full power to add to their number.

The meeting was then adjourned.

Digitized by Google

THE MAIDEN OF UNAHI.

BY

BASIL HALL CHAMBERLAIN, Esq.

Read before the Asiatic Society of Japan, on the 8th December, 1877.

——o——

It would seem natural to suppose that, in proportion as a land is strange and distant and but little known, so should it be easy, when once the key to its literature has been obtained, to draw forth therefrom treasures new and old, the European interpreter being confronted by no other difficulty than that of choice among such a superabundance of materials. This natural supposition, however, like many other natural suppositions, is not substantiated in practice. Just as it were vain to attempt to argue with one whose fundamental assumptions are diametrically opposed to a man's own, so is it well-nigh impossible to find anything that would be suitable to an English audience among the mountainous masses of a literature, which, like that of Japan, is swayed by canons of taste in all essentials different to those that rule the prose and poetry of Europe. What, for instance, save weariness could result from the consideration of a story whose point lies in a reference to some older tale, itself, perhaps, owing its interest to circumstances and conditions, which, however familiar to the natives, would have to be laboriously explained in order to make them at all comprehensible to the European reader? Or, again, how could a European

Digitized by Google

appreciate a stanza of poetry that derives all its piquancy from some untranslatable play upon words? And so it goes on, to the end of the chapter: plays upon words, allusions, apparent want of point, the pourtrayal of a state of manners, deeply interesting in itself, but stamped by peculiarities that render it unfit for discussion in our more prudish tongue, and a score of other ever-recurring characteristics must necessarily continue to keep nine-tenths—perhaps I should rather say ninety-nine hundredths—of the literature of this country a sealed book to such as are debarred from studying it in the original; and he who would attempt to give his countrymen some notion of the way in which this people write, of the mental atmosphere in which they live, turns away disheartened from almost every book that had at first sight seemed a promising field for translation.

The "Yamato-Monogatari," or "Tales of Japan"—one of the best known classics of this country,—are a case in point. The date of their composition, though not known with accuracy, is generally placed in the tenth century,*—a conclusion which there seems no reason to doubt, as it has both tradition and internal evidence in its favour; and the almost childlike simplicity of the style, and, above all, the purity of the diction, must ever make the work worthy the attention of the student of the standard literature of Japan. When we come, however, to analyze its contents, and to reject such of them as are rendered unfit for translation by one or other of the peculiarities above referred to, scarcely anything remains,—nothing, perhaps, save two or three very simple love-stories recorded in its latter part. It is with one of these old-world love-stories, as given in the pages of the "Yamato-Monogatari," and as likewise forming the theme of two or three of the poems of the very ancient "Mañefushifu" collection, that this paper is concerned. Reversing the chronological

* One old tradition ascribes its composition to Kuwa-zan-in (the posthumous name of the Mikado Kuwa-zan, who abdicated A.D. 986); and another to the 3rd son of the celebrated poet Arihara no Narihira, called Arihara no Shigeharu, who flourished at the end of the ninth (and beginning of the tenth?) century.

Digitized by Google

order, the later development of the story shall be given first, and then the earlier poetical version, dating probably from early in the 8th century. The story is believed to be, in the main, historical; and the maiden of Unahi's tomb, which is called the *Wotome-dzuka*, or more commonly, but improperly, *Motome-dzuka*, is said to be still shewn somewhere between Kaube and Ohosaka, though I may state that, on the occasion of a hurried visit to that part of the country, I was unable to discover it. Possibly, in this, as in so many other instances, the railway has obliterated the traces of the past.

The account given in the "Yamato Monogatari" is as follows:—

In days of old there dwelt a maiden in the land of Setsutsu, whose hand was sought in marriage by two lovers. One, Mubara by name, was a native of the same country-side; the other, called Chinu, was a native of the land of Idzumi. The two were alike in years, alike in face, in figure and in stature; and, whereas the maiden thought to accept the wooing of him that should the more dearly love her, lo! it fell out that they both loved her with the same love. No sooner faded the light of day, than both came to do their courting, and when they sent her gifts, the gifts were quite alike. Of neither could it be said that he excelled the other, and the girl meanwhile felt sick at heart. Had they been men of lukewarm devotion, neither would ever have obtained the maiden's hand; but it was because both of them, day after day and month after month, stood before the cottage-gate and made evident their affection in ten thousand different ways that the maiden pined with a divided love. Neither lover's gifts were accepted, and yet both would come and stand, bearing in their hands gifts. The maiden had a father and a mother, and they said to her: "Sad is it for us to have to "bear the burden of thine unseemly conduct in thus care- "lessly from month to month and from year to year caus- "ing others to sorrow. If thou wilt accept the one, after "a little time the other's love will cease." The maiden made answer: "That, likewise was my thought. But

Digitized by Google

"the sameness of the love of both has made me altogether "sick at heart. Alas! what shall I do?"

Now, in olden days, the people dwelt in houses raised on platforms built out into the river Ikuta.† So the girl's father and mother, summoning to their presence the two lovers, spake thus: "Our child is pining with a love "divided by the equal ardour of your worships. But "to-day we intend, by whatever means, to fix her choice. "One of you showeth his devotion by coming hither from "a distant home; the other is our neighbour, but his love "is boundless. This one and that are alike worthy of our "pitying regard." Both the lovers heard these words with respectful joy; and the father and mother continued: "What we have further in our minds to say is this: "floating on our river is a water-bird. Draw your bows "at it; and to him that shall strike it, will we have the "honour to present our daughter." "Well thought!" replied the lovers twain; and, drawing their bows at the same instant, one struck the bird in the head and the other in the tail, so that neither could claim to be the better marksman. Sick with love, the maiden cried out:

> Enough, enough! yon swiftly flowing wave
> Shall free my soul from her long anxious strife:
> Men call fair Settsu's stream the stream of life,
> But in that stream shall be the maiden's grave! ‡

and, with these words, let herself fall down into the river from the platform that overlooked it.

While the father and mother, frantic with grief, were raving and shouting, the two lovers plunged together into the stream. One caught hold of the maiden's foot and the other of her hand, and the three sank together, and perished in the flood. Terrible was the grief of the girl's

† I have been unable to discover any other traces of this custom.

‡ Here is the original stanza, of which the above does not pretend to be more than a paraphrase:

Sumi-wabinu
Waga mi nage-ten
Tsu no kuni no
Ikuta no kaha ha
Na nomi nari keri.

I have, in the above paraphrase, spelt Settsu as it is pronounced. In the prose text I have, as usual, followed Mr. Aston's system of transliteration.

Digitized by Google

father and mother as, amid tears and lamentations, they lifted her body out of the water and prepared to give it burial. The parents of the two lovers likewise came to the spot, and dug for their sons graves beside the grave of the maiden. Bnt the father and mother of him that dwelt in the same country-side raised an outcry, saying: "That he who belongs to the same land should be buried "in the same place, is just. But how shall it be lawful "for an alien to desecrate our soil?" So the parents of him that dwelt in Idzumi laded a junk with Idzumi earth, in which, having brought it to the spot, they laid their son: and to this day, the maiden's grave stands there in the middle, and the graves of her lovers on either side. Paintings, too, of all these scenes of bygone days have been presented to the former Empress,§ and, moved by the pictures, many persons have composed stanzas of poetry, putting themselves in the place of one or other of the three persons of the story . . . . . (Here follow a number of thirty-one syllable stanzas that are not worth the trouble of translating, and the tale then proceeds thus:) Ceremonial garments, trowsers, a hat, and a sash were placed in a large hollow bamboo-cane, and buried with the one (*i.e.* the native of Unahi), together with a bow, a quiver and a long sword. But the father and mother of the other must have been silly folks, for they prepared nothing in like manner. The "Maiden's Grave" is the name by which the grave is called.

A certain wayfarer, who once passed the night in the neighbourhood of the grave, startled by the sound of fighting, sent his retainers to enquire into the cause thereof. They returned saying that they could hear nothing. But the wayfarer kept pondering on the strange event, and at last fell asleep. Then there rose up before him a blood-stained man, who, kneeling at his side, spake thus: "I "am sorely harrassed by the persecutions of an enemy, "and entreat thee to condescend to lend me thy sword that

§ *Viz.*, (as the commentary called "Yamato-Monogatari-Sen" supposes) the consort of the Emperor Uda, who abdicated A D. 897, and died A.D. 931.

Digitized by Google

"I may be revenged on my tormentor." The request filled the wayfarer with alarm; nevertheless, he lent his sword, and, shortly awaking, imagined it to have been but a dream; yet in very truth the sword was missing; and, as he listened attentively, his ear caught the same terrific sound of fighting that had struck it at first. But a brief time elapsed before the spectre re-appeared, and exclaimed exultingly: "By thine honourable assistance have I slain the foe that "had oppressed me during these many years. From "henceforward, I will for ever watch over thy safety." He then told the tale from the beginning to the wayfarer, who, notwithstanding that the whole matter seemed to him to have an ugly look, would have enquired more particularly into the rights of so strange a story. But at that moment, day began to dawn, and he found himself alone. The next morning, from the foot of the grave a stream of blood was seen to flow; and the sword, also, was blood-stained. The tale seems a most uncomfortable one; but I tell it as it was told to me.

The "Mañefushifu" poet, Takahashi no Muraji Mushimaro, differs but little in his version of the story from the author of the "Yamato Monogatari," but still sufficiently to show that the latter was no mere copyist. Here is his ballad:

In Ashinóya dwelt a maid,—
The Maiden of Unáï,‖
On whose beauty the next-door neighbours e'en
Might cast no wondering eye;

For they locked her up as a child of eight,
When her hair hung loosely still;
And now her tresses were gathered up,
To float no more at will.

And the men all yearned that her sweet form
Might once more stand revealed,
That was hid from gaze, as in silken maze
The chrysalis lies concealed;

And they formed a hedge around the house,
And "I'll wed her!" they all did cry;
And the Champion of Chínu he was there,
And the Champion of Unáï.

‖ The proper spelling is *Unahi*, as given above; but the necessities of rhyme and metre compel me in this place to spell by ear, as in the case of *Settsu*.

Digitized by Google

With jealous love these Champions twain
The beauteous girl did woo:
Each had his hand on the hilt of his sword;
And a full-charged quiver, too,

Was slung o'er the back of each Champion fierce;
And a bow of snow-white wood
Did rest in the sinewy hand of each;
And the twain defiant stood:

Crying: "An 'twere for her dear sake,
"Nor fire nor flood I'd fear!"—
The Maiden heard each daring word,
But spake in her mother's ear:

"Alas! poor silly village-girl!
"What profits me my life?
"I cannot wed the man I love
"While lasts this jealous strife:

"At Hades' cross-road I'll await
"The issue of the fray."—
These secret words with many a tear
She whispered, and passed away.

To the Champion of Chínu, in a dream,
Her face that night was shown;
And he followed the Maid to Hades' shade,
And his rival was left alone,

Left alone,—too late! too late!
He dances in wild despair,
He gnashes his teeth, he screams and he yells,
And gapes at the vacant air:

"But no! I'll not yield!" he fiercely cries,
"I'm as good a man as he!"
And, girding his poniard, he follows after,
To search out his enemy.

The kinsmen, then, on either side
In solemn conclave met,
As a token for ages yet unborn
Some monument for to set,

That men might be telling of their loves
While heav'n and earth shall stand:
So they laid the Maiden in the midst,
And the Champions on either hand.

And I, when I hear the mournful tale,
I melt into bitter tears,
As though the fresh loss of some well-known friend
Had startled my loving ears.

There are in the "Mañefushifu" two other poems on the same subject. One of them, by the later poet Yakamochi,

Digitized by Google

is scarcely worth quoting, being little else than a repetition of the ballad just given. But the other, also by Takahashi no Muraji Mushimaro, may perhaps be of interest to the Society. It runs as follows:

THE GRAVE OF THE MAIDEN OF UNÁÏ.

I stand by the grave where they buried
The Maiden of Unáï,
Whom the rival village Champions
Did woo so jealously.

The grave should hand down her mem'ry
Till worlds shall be no more,
And men yet unborn shall love her,
And think on the days of yore:

And so, beside the causeway,
They piled up the boulders high,
To last till the clouds that o'ershadow us
Shall vanish from the sky.

And never a traveller passeth,
But stoppeth to turn aside,
And mourn o'er the grave of the Maiden;
And the country-folk, beside,

Ne'er cease from their bitter grieving,
But cluster around her tomb;
And men may still know her and love her,
And bewail the Maiden's doom,

Till, at last, e'en I stand gazing
On the grave where she now lies low,
And muse with unspeakable sadness
On the old days long ago.

Digitized by Google

ASIATIC SOCIETY OF JAPAN.

An ordinary meeting of the Society was held at the Grand Hotel, Yokohama, on Saturday, the 8th December, the chair being occupied by Sir Harry Parkes, the President of the Society.

Mr. Satow said that he wished to explain the inconsistent transliteration of some of the Japanese words contained in his paper on the Introduction of Tobacco, read before the Society on the 10th November. In common with Mr. Aston, and, he might add, several other students of Japanese both in this country and in Europe, he had arrived at the conclusion that in transliterating Japanese each sign of the syllabary should be represented by a separate combination of letters, and that the Japanese spelling should be followed, sign by sign, instead of the system of transliteration by ear being used. While the latter had hitherto been found to be the most convenient for popular uses, the former was of absolute necessity for scientific purposes, under which might be included the translation of Japanese texts, the study of etymology, and the compilation of Grammars and Dictionaries of the written language. In order to carry out this plan more thoroughly he had intended, in accordance with the suggestion of Professor Severini of Florence, to employ 'ñ' to denote ン of the Japanese syllabary, instead of 'n' which had hitherto been used. The letter 'n' was required to represent the initial consonant of the series ナ ニ ヌ ネ ノ, written *na, ni, nu, ne, no*, and should not be used for ン, which was employed in the syllabary to represent a sound which was in most cases originally ム, *mu*. Unfortunately, however, the fount used in printing the Transactions of the Society did not contain an italic 'ñ,' and consequently in several cases '*n*' had unavoidably been substituted for it.

Mr. Basil Hall Chamberlain then read his paper entitled "The Maiden of Unahi."

Mr. Satow observed that an interesting point in the paper which had been read was the mention of the ancient practice of burying with persons of importance, articles which might be supposed to be of use to them after death. In this case there were buried ceremonial garments, a bow and arrows, which formed part of the court costume of nobles at the time when the "Yamato Monogatari" was written, and it was quite natural for the author, whether a noble of the court or a Mikado, to attribute such rank to his hero. Notices of this practice were not numerous in Japanese literature, but the contents of some ancient graves which had been opened showed that it was by no means uncommon in early times. Precious stones or beads called *maga tama*, pieces of pottery and earthen images had been

Digitized by Google

found. The images were substitutes for the living human beings and animals originally buried at the graves of persons of rank. In the Nihoñgi there was a story that at the funeral of a prince named Yamato-hiko no Mikoto all his retainers were buried alive round his grave; that they lived for several days in that condition and that their cries reached the ear of the Mikado, who desired his counsellors to find out some way of abolishing the ancient practice of sacrificing to a dead man those whom he had loved during his life. Subsequently, when the consort of the same Mikado died, he again consulted his chief advisers, as to the means of doing away with what had already been recognised as a bad custom, and by the advice of one of them, named Nomu no Sukune, a hundred workmen in clay were brought from Idzumo, who made clay images of human beings, horses and other things not particularized. It was thereupon decreed that in future clay images should be substituted for the human sacrifices customary up to that time. According to the date given in the Nihoñgi this change would have been made in A.D. 3, but the chronology of the early Japanese traditions recorded in that book is not to be depended on for exactness.

Mr. J. C. Hall, referring to the metrical versions given in by the paper of the poems from the Mañefushifu, and to others the same hand previously published, warmly commended the good work which Mr. Chamberlain was doing in exhibiting to foreign readers in a worthy setting what, on such competent judgment, must be taken to be amongst the choicest gems of the Japanese lyric muse. Highly as their national poetry was esteemed by the Japanese themselves, however, it seemed at least doubtful if its merits were such as to entitle it to a high place amongst the world's literature. The Japanese, he said, have not a single epic poem, and their drama, judged by European standards, is yet in a rudimentary stage of development. Lyric poetry of a sort, in the primary sense of metre set to a musical accompaniment, they have in their lyric dramas, but in the wider sense of poems expressive of sustained emotion, their lyrics seem scarcely worthy of the name. In fact, the bulk of Japanese poetical literature consists of verses too short, in point of form, to be entitled to be called poems, and in point of matter, too full of conceits and historical, local or other allusions to be capable of effective translation into a foreign tongue.

In reply to some of Mr. Hall's observations, Mr. Chamberlain remarked that it was difficult in speaking of these subjects to bring forward positive proof of assertions made, and that the argument must of necessity often reduce itself to: "You think one way, and I think another." While admitting that the Japanese had neither any epics nor yet any didactic poems, he contended that they had many lyrics of great beauty, and that the poetry of the "*Nou*" (mediæval dramas) was very perfect in its way, referring Mr. Hall for the lyric poetry to the pages of the "Mañefushifu," the "Kokiñshifu," and the other numerous collections forming together the "Ni-

Digitized by Google

jifu-ichi-dai-shifu." Mr. Chamberlain objected to the word "conceits" as applied to the greater part of the poetical productions of Japan, and, in defence of his opinion touching the lyrical power of some of the poets of this country, quoted (in a translation) a portion of an ode on the "Unsatisfactoriness of Life," by the poet Yamagami no Okura. Mr. Chamberlain also objected to the view that a body of literature must be judged by its adaptability to the purposes of translation or presentation to foreign minds, and held that beauty of form a) beauty necessarily confined to the original) constituted one half, and, perhaps, the better half of its titles to regard. While thus differing from the views conveyed by Mr. Hall's observations, Mr. Chamberlain could not, however, but be sensible of the flattering—the too flattering—manner in which some of these observations had referred to his own knowledge of Japanese literature.

The President observed that whatever might be the poetical merits of Japanese verse, he presumed that the early writings, whether in prose or metre, would be found to possess the special value which attaches to all old literature, that of throwing light on past history and ancient manners and customs, and also of shewing how the language was gradually formed and developed. The Book of Odes and other Classics of China were particularly valuable in these respects, proving, as they did, the high degree of civilization to which that country had attained at a very early date. The tale of the 'Maiden of Unahi' gives us an interesting insight into social life in Japan about a thousand years ago; it treats of the 'old, old story' of love, and shows that the wooing of those days was conducted with a degree of delicacy, fervour and romance, which did credit, he thought, to the Japanese of that age. The curious fancy of the rival lovers not fighting with each other while living, as would probably have been the case elsewhere, but reserving their combat for the grave where they could only disturb their own shades, indicates, perhaps, the respect then felt for the King's peace. The circumstance of the people dwelling in houses raised on platforms built out into the river Ikuta was illustrative of the architecture of those days, and the description of that stream—now wholly choked up and almost obliterated—showed how greatly it had changed since the time of the tale. The burial ceremonies referred to were also instructive; they showed that cremation was not then practised, and that the custom of burying weapons, clothing, etc., with the deceased, was then observed. It would be most interesting to trace the early burial rites of Japan from the time of human sacrifice referred to by Mr. Satow, to the subsequent adoption of clay images, and of paper imitations of articles of use which are still burnt at the grave or placed in coffins in China at this day. Clay images are now found in old tombs in the neighbourhood of Nara and elsewhere. These few points serve to show how much may be learned from tales of this kind, but the purity of the diction of the story of the

Digitized by Google

'Maiden of Unahi' seemed to him to be its chief charm. He thanked Mr. Chamberlain for having furnished the Society with such an interesting specimen of the early literature of Japan, and trusted that the difficulties and the labour which attend research in this unexplored field would not deter him from continuing a study which promises much good result.

At the conclusion of the meeting, Mr. Chamberlain begged to bring before the notice of the Society a work by the Revd. John Ross, of Newchwang, entitled "Corean Primer"—the first book, so far as he knew, published by a European in the Corean type. He stated that Mr. Ross had sent him some copies for sale in Japan, and that the price was $2 per copy.

Digitized by Google

Digitized by Google

THE CASTLE OF YEDO.

BY

THOMAS R. H. McCLATCHIE,

Read before the Asiatic Society of Japan, on the 22nd December, 1877.

Hardly any foreign traveller coming to Yedo can have failed to pay a visit to the Castle, which forms so large a portion of the city itself. Those, in particular, who have had the good fortune to visit it prior to the recent extinction of the feudal system hitherto prevailing in Japan, cannot fail to have been struck by the scenes that there met their view. The long lines of *Daimiôs'* mansions, with swarms of two-sworded retainers about the doors,—the broad streets, along which the trains of the various nobles, with brave following of horse and foot, were constantly passing to and fro,—and the stately towers and buildings of the Castle palace itself, appearing from amidst the trees in the centre of the lines of defence composed of wide moats, stone bastions, and massive gateways,—all formed a sight which, once seen, was never to be forgotten. And although, of later years, its glory has sadly departed, the towers and out-buildings well-nigh disappeared, and many of the gateways been completely demolished, there yet remains much to interest the antiquary. The broad causeways running along the sides of moats covered in the autumn months with lotuses in full bloom

Digitized by Google

and in the winter time teeming with wild-fowl,—the stone-faced embankments,—the noble trees and beautiful gardens, still exist, to tell the tale of former greatness, and to carry back the thoughts of the visitor to the olden times when the Shôgun held his Court in the present metropolis of Japan. The Castle of Yedo will always be one of the most interesting localities in the city, and therefore the following notes relating to its foundation and subsequent history may not be unacceptable.

As, in the course of this paper, constant reference must necessarily be made to the various gateways of the Castle, each of which possesses a special name, it is perhaps as well to call attention in the first place to the accompanying plan of the whole enclosure. This plan, with the exception of the very central portion, has been copied from a large map of the city of Yedo published some years back and finally revised in 1852, so that it may be taken as representing the ground-plan of the Castle as it existed immediately prior to the commencement of Japan's nearer intercourse with foreign nations. It was not permitted to publish in any map the plan of the central line of defences, but a bird's-eye view of the Castle as painted on an old screen from the former Shôgun's palace at Kiôto, together with personal observation of the works still standing, have supplied the deficiency, and this plan may therefore be accepted as correct. The course of the moats is here laid down, and the sites of the *yashikis*, or mansions of the nobles, are also marked, with various minor particulars. Each gateway is numbered, and these numbers correspond to the names given in the following list, only a few of the entrances to the palace itself being doubtful.

List of Gates in Yedo Castle.

1 *a.* (?) *Naka no Go-mon*..... or, Central Gate.
1 *b.* *Naka Suzumé Go-mon*.. „ Centrai Sparrow Gate.
1 *c.* (Name unknown.)
2. (?) *Ôté-san-no Go-mon*.... „ 3rd Chief Gate.
3. (?) *Ôté-naka Go-mon*..... „ Middle Chief Gate.
4. *Hasu-iké Go-mon*..... „ Lotus-pool Gate.

Digitized by Google

5. *Nishi hané-bashi Go-mon*.. „ Western draw-bridge Gate.
6. *Kita hané-bashi Go-mon*.. „ Northern draw-bridge Gate.
7. *Bairin-zaka Go-mon*..... „ Plum-forest steps Gate.
8. *Ôté Go-mon*..... „ Chief Gate.
9. *Hirakawa-guchi Go-mon*.. „ Hirakawa Gate (named from district.)
10. *Také-bashi Go-mon*..... „ Bamboo Bridge Gate.
11. (Name unknown).....
12. *Momiji-yama Go-mon*..... „ Maple Mount Gate.
13. *Nishi-maru o ura Go-mon*. „ Rear Gate to the Western Enclosure (as opposed to the Chief Enclosure of the castle).
14. *Saka-shita Go-mon*..... „ Gate below the steps.
15. *Uchi Sakurada Go-mon*, (also called *Kikiyô Go-mon*, after the name of a certain flower). „ Inner Sakurada Gate (district).
16. *Nishi-maru Ôté Go-mon*... „ Chief Gate of Western Enclosure.
17. Apparently unnamed; but this, and the one immediately preceding, are together known as the *Ni-jiu-bashi*..... „ Double Bridge.
18. (Name unknown).
19. *Soto Sakurada Go-mon*... „ Outer Sakurada Gate (district).
20. *Hanzô Go-mon*..... „ Hanzô Gate (person's name).
21. *Tayasu Go-mon*..... „ Tayasu Gate (named after one of the "Three Noble Families,"—*Go-san-kiô*—allied to the Tokugawa clan).

Digitized by Google

22. *Shimidzu Go-mon*..... „ Shimidzu Gate (after another of the *Go-san-kiô*).
23. *Kiji-bashi Go-mon*..... „ Pheasant Bridge Gate.
24. *Hitotsubashi Go-mon* ..... „ Hitotsubashi Gate (after the third of the *Go-san-kiô*).
25. *Watagura Go-mon*..... „ Watagura Gate (district).
26. *Baba-saki Go-mon*..... „ Gate before the race-course.
27. *Hibiya Go-mon*..... „ Hibiya Gate (district).
28. *Sukiya-bashi Go-mon*..... „ Sukiya Bridge Gate (district).
29. *Kaji-bashi Go-mon*..... „ Blacksmith's Bridge Gate.
30. *Gofuku-bashi Go-mon* .... „ Gofuku Bridge Gate (street).
31. *Tokiwa-bashi Go-mon*..... „ Everlasting Bridge Gate.
32. *Kanda-bashi Go-mon*..... „ Kanda Bridge Gate (district).
33. *Yama-shita Go-mon*..... „ Gate below the hill.
34. *Saiwai-bashi Go-mon*..... „ Good-luck Bridge Gate.
35. *Atarashi-bashi* ..... „ New Gate.
36. *Tora no Go-mon*..... „ Tiger Gate.
37. *Akasaka Go-mon* ..... „ Akasaka Gate (district).
38. *Kui-chigai Go-mon*..... „ Crooked Gate.
39. *Yotsuya Go-mon*..... „ Yotsuya Gate (district).
40. *Ichigaya Go-mon*... ..... „ Ichigaya Gate (district).
41. *Ushigomi Go-mon* ..... „ Ushigomi Gate (named after a *Daimiô*).
42. *Koishikawa Go-mon*... .... „ Koishikawa Gate (district).
43. *Suidô-bashi* ..... „ Aqueduct Bridge.

Digitized by Google

44. *Shôhei-bashi*..... „ Shôhei Bridge (named after a place in China).
45. *Suji-kaë Go-mon*..... „ Slanting Gate (from structure of bridge outside).
46. *Idzumi-bashi*..... „ Idzumi Bridge (from the title of a *Daimiô*).
47. *Atarashi-bashi*..... „ New Bridge.
48. *Asakusa-bashi Go-mon*.... „ Asakusa Bridge Gate (district).

The above is a list of the gates as they stood in recent times; but it must not be supposed that these have always existed, nor that the castle enclosure was in olden days of the same wide dimensions as at present. This large total has been obtained by many an addition to the original number, which was very small indeed. And this remark leads us back to the consideration of the earliest days of the Castle's existence.

The foundation of the Castle of Yedo was laid in the year 1456 A.D., during the reign of the 103rd Emperor of Japan, Go-Hanazono (1429-1464). The founder was Ôta Saëmon no Taiyu Mochisuké, commonly known as Ôta Dôku'an, a famous warrior of his age, and a chief retainer of the Uyésugi family, which at that time held supremacy in the east of Japan,—a member of it, named Uyésugi Sadamasa, being one of the then *Ku'anrei* or Governors of Kamakura, under the Ashikaga Shôgunate. Both Ôta Dôku'an and his father, Ôta Dôshin, seem to have possessed considerable skill in the construction of fortifications, and the castles of Kawagoyé and Iwatsuki,—both situated in the province of Musashi, some thirty miles to the north-west of Yedo,—are also stated to have been their respective handiwork. Some few Japanese authors assert indeed that Dôshin, and not Dôku'an, was the founder of the castle of Yedo, but these writers are decidedly in the minority, for nearly every work in which mention is made of the subject gives the younger Ota the credit of the foundation.

Digitized by Google

In particular, a book entitled *Shiudzu Gak'hetsu-ki,* (主圖合結記) which specially treats of Japanese fortifications, holds this view. Dôku'an's own residence was at Goten-yama, the rising ground in the rear of the present suburb of Shinagawa. He was stationed in this spot by the Kamakura authorities in order to guard against any attack from the East, during the troublous times then prevailing in this part of Japan. Round Shinagawa he placed a chain of small look-out stations, and the site of one of these, a lofty mound, still remains in the grounds of a *yashiki* formerly belonging to a *Daimiô* named Toki Iyo no Kami, at Takanawa,—till recently occupied by the British Legation. An inscription on a stone placed on the mound narrates this fact, and states that the name of the locality was changed to Kato by Dôku'an. But the skilful General could not but perceive the immense superiority of the present site over that which he then occupied. The numerous rivers here flowing into the Bay of Yedo afforded great facility for communication with the interior and for the transport and shipment of produce, and he was not slow in determining to erect a fresh castle higher up the coast. Only a few houses of fishermen then lined the beach, and for miles and miles inland stretched the wide plain of Musashi, covered only with reeds and sedge. The place was admirably adapted for making a stand against any army advancing from the East, and we find it recorded as a fact that in later times, whenever war broke out in this part of the country, the first care of the Commandant of Yedo Castle was to throw forward a detachment of troops to the bank of the branch of the Tonégawa which flows into Yedo Bay, in order to prevent the enemy from crossing that river. If successful in the field, these troops could inflict a severe check upon the advancing foe; if themselves worsted, they could always fall back on the Castle. Having thus selected a desirable position, Dôku'an forthwith began his work. A small book named "*Ochiboshiu*" (落穗集), which contains various items of interest with regard to the Castle, narrates that he first marked

Digitized by Google

out, by means of leafy bamboos, the site upon which he purposed to build. Within the space thus enclosed were three small villages, called Chiyota, Takarata, and Iwaita. Dôku'an, on learning this from the villagers, remarked that all these names, as well as those of the department and the province, were words of good omen ; and he hailed this circumstance as a fortunate sign of the future prosperity of his stronghold. It may be noticed, in connection with this, that the Castle was commonly known as "Chiyota Castle" until it passed into the hands of the Tokugawa family a century and a half later on. Dôku'an commenced the work in the year 1456, and completed it on the 8th day of the 4th month in the year following, when he removed to the Castle and took up his residence there. After this the place rapidly increased in importance, and a large town soon rose up beneath the protecting shadow of the Castle walls. The following extract from a work entitled "*Kôtei-ki*" (江亭記), a description of Yedo, published in 1476 (twenty years after the foundation of the Castle and during Dôku'an's lifetime,) gives an idea of the importance at that time deemed to attach to the locality, both from a military and a commercial point of view:

"The Castle of Yedo in the Province of Musashi was "first constructed by Ôta Sakingo Dôku'an. To the east "of the Hakoné Barrier there are few who can rival him. "He has always been the most influential man of his time, "—is both mighty in power and kindly in disposition, and "possessed of numerous accomplishments. During the "disturbances now prevailing, only three of the eight "Barrier provinces submit to the rule of the Sovereign ; "the tranquillity or peril of those three depends on the "state of the province of Musashi alone, while the "tranquillity or peril of that one, again, depends on "the single Castle of Ôta himself. The locality in "which it stands is more prosperous than any other "province, both as regards products of sea and land, and "as being the resort of vessels and wheeled vehicles. "The ramparts around it are over 10 *jô* (*i. e.* 100 feet) in

Digitized by Google

"height; they are steep and perpendicular, and consist of "firmly built stone walls for a distance of 10 *ri* (1 *ri* = "about 2½ English miles) in circumference. On the out- "side are wide moats and deep ditches, holding a large "quantity of water, but little of which is allowed to flow "by. Huge timbers are thrown across them, so as to "form bridges, kept for purposes of passage in or out. "The gates are of iron, with barriers of stone, the pas- "sage-ways being also paved with the same. If, going "now to the left, and now turning to the right, one ascend "the Castle towers, the pavilion of the lord may be seen "in the midst, and in its rear his actual residence, with "guard-houses on either side. The towers and ramparts, "and the military store-houses or godowns for grain, the "stables, barracks, and other roofed buildings are very "numerous."

It is, of course, difficult to lay down with any great degree of accuracy the limits of the Castle at the time of its first construction, but its dimensions were certainly extremely narrow. From various passages, however, in the "*Yedo Meisho Dzuyé*" or "Pictorial Guide to the celebrated localities of Yedo," and in a small work entitled "*Tonoi-bukuro*," (published in 1839) containing various rules and hints for the guidance of the Castle guards under the Tokugawa régime, it would seem that Ôta Dôku'an's work comprised merely the very central enclosure of all as shown in the plan. In the year 1474, Dôku'an held a poetical meeting in the Castle, at which sixteen guests of literary renown were present. Many of the verses composed on this occasion are still extant, and that of Dôku'an himself particularly alludes to the view from his fortress. This verse runs as follows:—

"To my hut adjoins a fir-tree plain, and hard by rolls "the sea; the lofty peak of Fuji is seen from below the "eaves."

The "fir-tree plain" to which allusion is here made was a copse of firs inside the spot where the Tayasu Gate now stands; and at the time in question the present

Digitized by Google

line of moat from the Watagura to the Hibiya Gate was "a sea-beaten beach, with only fishermen's huts thereon." We also read that the "plum-forest" from which the Bairin-zaka Gate afterwards took its name was only planted by Dôku'an four years later, in 1478. With regard to the general appearance of the lines of defence of the Castle, as at first constructed, no definite records have been preserved; but they cannot have been of any extraordinary strength. Without turning off into a dissertation upon Japanese fortifications in general, it may here be observed that, from the native works treating of this subject, it may be gathered that the ancient style of defences for strongholds in this country was very similar to that of the old Roman camps. First, a wide and deep ditch was dug; the earth thus displaced was then thrown up on the inside of the ditch, so as to form a firm embankment; and on the summit of this was placed a slight superstructure or rampart of wattled stakes. The entrance-gates were built of solid timbers, with heavy wooden doors, and were usually surmounted by a small platform whence archers could discharge their shafts. The description of the Castle as above quoted would therefore seem to be couched in rather more flowery terms than were warranted by the actual extent and appearance of the structure.

For more than a century after its foundation, the neighbourhood of the Castle was the theatre of civil war. The interminable feuds existing between the powerful families of the Ku'antô (the name given to the eight provinces east of the Hakoné barrier) kept this part of Japan in a state of anarchy, and all through this troublous period the Castle garrison played a conspicuous part. In 1477 Ôta Dôku'an was recalled to Kamakura, where military operations demanded his attention, and during his short absence Uyésugi Tomomasa, Miura Yoshiatsu, and Chiba Yoritané, all vassals of the Uyésugi family, acted as Commandants. In the year 1486, hostilities broke out between Uyésugi Akisada and Uyésugi Sadamasa,—Dôku'an's lord,—and some secret emissaries of

Digitized by Google

the former contrived to slander the general to such an extent that Sadamasa ordered him to be put to death, and committed the Castle to the custody of one Soga Bungo no Kami. Next to him, Sadamasa's two sons, Tomoyoshi and Tomoöki, were in command. About this period, however, what was styled the "Later Hôjô" family was rising to supremacy in the Ku'antô, and in 1524 the Castle was attacked and taken by Hôjô Ujitsuna, when the above-named Tomoöki was completely routed, and fled away to the Castle of Kawagoyé. This is the only instance on record of Yedo Castle having sustained a siege.

The Castle remained in the hands of the Hôjô for many years later. This family, however, established their chief seat at the town of Odawara, not at Yedo, and the latter place was held by their retainers during the "four generations" of the house of Hôjô. These retainers belonged to the two families of Tôyama and Tominaga, and their command lasted until 1590. Several additions would appear to have been made to the Castle enclosure during this period, and to these reference is made later. There has, moreover, come down to modern times a copy of a diary kept by one Soboku, a famous poet; he describes therein a visit paid by him to Yedo in 1545, and the kind reception he met with at the hands of the Commandant, Tôyama Kai no Kami, who, amidst all the confusion of his preparations for an expedition against the province of Shimôsa, yet found time to entertain his guest, and to challenge him to a friendly contest of verse-making. Soboku also met here one Ôta Echizen no Kami, probably a descendant of the illustrious founder of the Castle.

In 1590, the family of Hôjô was overthrown, and the town of Odawara taken, by the famous Toyotomi Hidéyoshi, who bestowed upon his General, Tokugawa Iyéyasu, the eight provinces of Ku'antô, directing him at the same time to fix his residence at Yedo. The latter did so, and the Castle was the abode of generation after gene-

Digitized by Google

ration of the Tokugawa Shôguns, until the close of that dynasty in 1868. The history called "*Nihon Gu'aishi*" thus narrates the circumstance, and it is amusing to compare the description of the Castle, as therein given, with the flowery language already quoted above :—

"The Dainagon (Iyéyasu), after consultation with "Hidéyoshi, set up his residence at Yedo, and went "thither on the 1st day of the 8th month (of 1590). "* * * * The district of Yedo was bounded on the "East by the river Sumida, and on the South faced the "bay; to the West and North it adjoined the Plain of "Musashi. A general of the Uyésugi family, named "Ôta Dôku'an, had first erected a Castle there. The "locality was flat and marshy, and over-grown with "reeds. The Castle enclosure was limited in extent, and "unsightly in appearance; the flights of steps were built "of old ship's boards. Honda Masanobu remarked, 'In "'such a place as this my lord cannot receive guests! "'I pray that it may be put in repair.' The Dainagon "laughed and replied, 'Do you entertain such a woman-"'ish idea as this? The question of repairs is one that "'can be deferred awhile.'"

True to his words, the first care of Iyéyasu was to provide for the safety of his new stronghold. In order the more effectually to secure this, he portioned out to his officers the lands in the vicinity, and established a regular cordon of fortresses, in the shape of a rough horse-shoe, around the Castle of Yedo, forming, as it were, the outworks to the main citadel. The "*Nihon Gu'aishi*" gives a full list, too long to be quoted here, of these fortresses and of the officers upon whom they were respectively bestowed. They were in all thirty-two in number, and foremost amongst them were Koga and Sékiyado in the province of Shimôsa, Iwatsuki and Kawagoyé in Musashi, and Odawara in Sagami, all of which have since continued to be the seats of *Daimiôs* until a few years back. Having thus displayed his generalship in strengthening his position, Iyéyasu was able to turn his attention to minor matters relating to his own Castle.

Digitized by Google

The very first of these was the extension of his patronage to the temple of Zôjôji.

This temple, now better known to foreigners by the name of the district (Shiba) in which it at present stands, was in 1590 situated on the shore just to the east of the site afterwards occupied by the Watagura Gate. As Iyéyasu was riding into Yedo, and was approaching the main entrance of the Castle, the incumbent of the temple, one Genyo Son-ô, stood before his gate to see the procession go by. What followed is best told in the words of the priest himself, as recorded in the archives of Zôjôji, and reprinted therefrom in the "*Tonoi-bukuro*":—

"My lord, riding on horseback, was just passing in "front of the temple gate, when, strange to say, his horse "stood still, of himself, and would not advance. My lord "looked to left and right, and perceived a priest before "the gate. He gave orders to his attendants, say-"ing, 'Enquire what priest that is.' They therefore "questioned me, when I replied, 'The temple is of the "'Jôdo sect, and my own name is Son-ô.' But before "the attendants had repeated to him my answer, my lord "caught the words as he sat on horseback, and said, "'Then you are Son-ô, the pupil of Kanyo?'—(Kanyo "was the priest of the temple of Taijiuji, in Iyéyasu's "own province of Mikawa).—I could only utter in re-"sponse an exclamation of surprise. 'Then I'll halt "'awhile at your temple,' said he, and he entered Zôjôji. "My lord next observed, 'I wish to take a meal by my-"'self in this temple to-morrow morning, but it is quite "'unnecessary for you to make any extensive prepara-"'tions,'—and with these words he went on his way. "True to his promise, he arrived early next day. I was "in the greatest delight, and offered him a humble repast. "Then said my lord, 'My sole reason for stating my de-"'sire to take a meal here this morning was as follows. "'For a general to be without an ancestral temple of his "'own is as though he were forgetful of the fact that he "'must die. Taijiuji, in the province of Mikawa, has of "'course been the temple of my forefathers for generations

Digitized by Google

"'back, but what I have now come to beg of you is to "'let me make this my own ancestral temple here, and "'to enter with me into a compact as priest and parish-"'ioner.' With tears of joy, I assented. He with all "reverence pronounced his acquiescence in the Ten "Buddhist Precepts, and then went back to the Castle. "After this, he was pleased to remove Zôjôji to Sakurada, "but on the grounds that it rendered the frontage of his "Castle too confined, it was shortly afterwards (in 1598) "removed once more to its present site to the west of the "sea-beach at Shiba."

In addition to the substantial benefits accruing to Zôjôji from the patronage of the Tokugawa family, there was also afterwards granted to each succeeding head priest of the temple the high privilege, on going to the Castle, of riding in his palanquin up to the very entrance-hall, instead of dismounting at the usual place, of which mention is made below.

Iyéyasu next turned his attention to the extension of the Castle enclosure, the erection of gates and bridges, and the excavation of the moats. The "*Yedo Meisho*" here remarks, "until that time it was merely a small "fortification, so, during the period Keichô (1596-1615) "the site of the Castle grounds was widened, and it was "made a grand structure as it at present stands, being an "immense Castle immutable for myriads of years." There can be no doubt that many additions had at this time already been made to the original structure as built by Ôta Dôkuʼan, and the description given in the "*Ochibo-shiu*" is sufficiently explicit to convey a tolerably good idea of the Castle at the moment when it passed into the hands of the Tokugawa family. The defences consisted of dry ditches of great width, and of grass-grown earthen embankments. In no part of the Castle were these banks faced with stone. The main entrance was where the Ôte-san-no Go-mon now stands, and hard by was a clump of trees and bamboos. The site of the present *Nishi-maru* or Western Enclosure was then rough hilly ground, with very slight cultivation, and overgrown with peach

Digitized by Google

and plum trees. This hill was very far separated from the *Hon-maru*, or Chief Enclosure, and a broad roadway led below the Momiji-yama in the direction of the present Hanzô Gate. At the spot where the outer Sakurada Gate now stands was a large wooden gateway, without any door, called the "Odawara Gate," which name was afterwards changed by Iyéyasu. Immediately below the then Chief Enclosure were two others, styled respectively the Second and Third Enclosures: these were separated by dry moats, one of which is said to have been forty yards in width. The buildings, although greatly dilapidated, still stood as of yore, and were made to serve the purpose of barracks for the retainers of the Tokugawa chieftain. They consisted, for the most part, of very small *yashikis*, although there were a few of tolerably large size. The roofs were not of shingle, but were formed of large planks of cedar-wood, brought from the the province of Kai and from the neighbourhood of Nikkô in Shimotsuké. The out-houses attached to the former pavilion in the centre were merely thatched with straw, but were very spacious. Two or three small temples also stood in different places within the enclosures. These temples were, by order of Iyéyasu, moved elsewhere; and he then widened the site of the Chief Enclosure by filling in the dry ditches immediately around it. Fresh moats were next excavated, the embankments were faced with large stones brought up in junks from the coast of Idzu, and the whole aspect of the Castle was so much altered that, to quote the words of the *Ochibo-shiu*, "it seemed as though there were left no trace of "resemblance to the former structure, and its general "condition was greatly changed." The Western Enclosure was next added, the intention of Iyéyasu being to erect therein a palace for himself, in which to reside after he had resigned the reins of Government into the hands of his son. But after the consolidation of his power by his crowning victory at Sékigahara, in the year 1600, he fixed upon Sumpu (Shidzuóka, in the province of Suruga) as his future residence, and the Sakashita and Momiji-

Digitized by Google

yama-shita Gates were built: the new Western Enclosure was thus united to the Chief Enclosure, and the public no longer had free access, as heretofore, to the Momiji-yama and the Sannô Shrine placed thereon, of which mention is made below. The stone-work on the Western Enclosure was added by Hidétada, during the lifetime of Iyéyasu, and the earth from the moat around it was used to raise the level of the sea-beach where the towns-people's houses stood. Minute details as to the dates of the construction of the different gates, etc., would prove far too long for insertion in this paper, but it may be briefly stated that with the exception of a considerable portion of the very outside moat, and a few of the gates, the Castle as it now stands is just as it was laid out by the founder of the Tokugawa dynasty. The remaining portion of the outside moat,—from the the wide pool called Taméiké (above the Tora Gate) to its junction with the Kanda river just to the west of the present Suidô-bashi,—was excavated by Iyémitsu, the grandson of Iyéyasu, in the year 1636. This pool at first furnished the necessary supply of water to the Castle;—it was stocked with fish from Lake Biwa and from the Yodo river near Kiôto, and it is said that these fish changed slightly in form after their removal. The course of the Kanda river was altered shortly afterwards, so as to afford a supply of water on the northern side of the Castle. In the period Manji (1658-61), under Iyétsuna, the fourth Shôgun of his line, the deep cutting in the moat between the Suidô-bashi and the Sujikaë Gate was widened by the *Daimiô* of Sendai, by order of the Shôgun, so as to make it navigable for boats, and thus free communication was opened between the Kanda river and the sea. From this spot down to the Asakusa Gate, willow-trees were planted along the inner bank of the moat, which was in consequence styled Yanagiwara, or the "Willow Plain"—the name it bears even at the present day. The modern Ôté Gate was first built in 1659, and since then has always been considered the main entrance to the Castle. The "*Ochibo-shiu*" narrates that "on the evening of the

Digitized by Google

"15th of the 8th month of the year in which this bridge "was constructed, the night being very fine, the members "of the Chief Council *(Gorôjiu)*, by common consent, "spread on the bridge rugs of many colors, and matting, "and held a grand drinking bout, which they kept up "until midnight. There were consequently despatched "from the Chief Enclosure some of the gentlemen-in-wait- "ing, with a message from the Shôgun to the effect that, "having heard of their being assembled to gaze upon the "moon from the bridge, he was pleased to send them an "addition to their feast from his own table." The Baba-saki Gate was added in 1711, under the circumstances mentioned hereafter.

So much for the history of the gradual growth of the Castle from its foundation to its completion. It is easy to understand that to a hostile army unprovided with siege artillery, it would have been well-nigh impregnable. On the lower ground immediately fronting the sea, the lines of defence consist of high embankments,—faced on the outside with large stones, roughly hewn, and fitted together without mortar,—rising up almost perpendicularly from the surface of the moats. On the higher ground in the rear of the Castle, the moats are very deep, wide trenches, originally dry, but now having several feet of water at the very bottom, and the lofty grass-grown ramparts thus formed are further strengthened on the inner side by a low stone-faced embankment on the summit. Above the embank-ments all round the Castle, there stood till a few years back a slight upper defence composed of upright wooden stakes supporting a thin palisade of bamboo work daubed with clay, and whitewashed on the outside. The gates are approached, in the lower Castle, by bridges, and in the upper part by causeways on either side of which is a sheer descent to the deep moat below. The gateways are nearly all of the same shape. They are built in the form of a square, and have substantial stone foundations rising to a height of several feet above the level of the ground. On this foundation is raised a plastered superstructure of

Digitized by Google

similar style to that above mentioned. The entrance on the outer side of the square consists of a heavy wooden gate, the height varying from ten to eighteen feet, covered over with a narrow tiled roofing. The inner gates are much narrower, and composed of far more massive timbers, while above them stands a second story, with white plastered walls, and surrounded with loopholes. The room in this upper story projects far beyond the gate itself, and immediately above the entrance the planking of the floor was made moveable, so as to allow of missiles being hurled down therefrom on the heads of besieging foes below. The roofs are high, with long upturned eaves, and a large bronze ornament in the shape of a fish is placed upright at each end of the roof ridge. The foundations of some of these gates are remarkably well built as compared with the rough stone-work in other places, and as an example of strength the "*Yedo Meisho*" calls attention to the masonry of the Saiwai Gate. This was erected by the Tsugaru family, of Ôshiu, and being the gate by which the Shôgun always left the Castle when proceeding to the Southward, special care was no doubt bestowed upon its construction. For beauty, the same book gives the palm to the Akasaka Gate, where a long and gradually ascending slope leads up to the entrance between a clump of magnificent trees overhanging the Tamé-iké on the right, and a high grassy bank rising from the moat covered with lotuses on the left; while two *Daimiô's* mansions on very elevated sites just within the gate, look down on the whole. On the battlements of the inner moats, small towers, two or three stories high, used to stand at every corner, and of these three yet remain. In the centre of all, on the summit of the high raised terrace occupied by the palace itself, towered aloft the huge keep or citadel, on a wide and solid stone foundation, and this was no less than five stories in height. But perhaps the best idea of the appearance of the castle just after its reconstruction in the earlier days of the Tokugawa rule is to be gathered from the description given in Dr. Kæmpfer's "History of Japan;" and though this is rather a long

Digitized by Google

one, it may not be uninteresting to quote it here, seeing that the writer was himself an eyewitness of the scenes he therein describes. Dr. Kæmpfer visited Yedo in February 1691, and his description of the Castle, or "residence of the *Emperor*," as he erroneously styles it, is as follows :—

"The Castle is seated about the middle of the city. It "is of an irregular figure inclining to the round, and hath "five Japanese miles in circumference. It consists of "two enclosures, or fore-castles, as one may call them, the "innermost and third castle, which is properly the resi- "dence of the Emperor, two other strong well-fortified, "but smaller castles at the sides, and some large gardens "behind the Imperial Palace. I call all these several "divisions castles, because they are separately, and every "one by itself, enclosed with walls and ditches. The first "and outermost castle takes in a large spot of ground, "which encompasses the second, and half the Imperial "residence, and is enclosed itself with walls and "ditches, and strong well guarded gates. It hath so "many streets, ditches, and canals, that I could not "easily get a plan of it; nor could I gather anything "to my satisfaction out of the plans of the Japanese "themselves. * * * In this outermost castle reside "the Princes of the Empire, with their families, living "in commodious and stately palaces built in streets, "with spacious courts shut up by strong heavy gates. "The second castle takes in a much smaller spot of ground; "it fronts the third, and residence of the Emperor, and is "enclosed by the first, but separate from both by walls, "ditches, draw-bridges, and strong gates: the guard of "this second castle is much more numerous than that of "the first. In it are the stately palaces of some of the "most powerful Princes of the Empire, the Councillors of "state, the prime ministers, chief officers of the crown, "and such other persons, who must give a more immediate "attendance upon the Emperor's person. The castle itself, "where the Emperor resides, is seated somewhat higher "than the others, on the top of a hill, which hath been

Digitized by Google

"purposely flatted for the Imperial palace to be built upon "it. It is enclosed with a thick strong wall of freestone, "with bastions standing out much after the manner of "the European fortifications. A rampart of earth is raised "against the inside of this wall, and at the top of it stand, "for ornament and defence, several long buildings and "square guardhouses built in form of towers several stories "high. Particularly the structures on that side where "the Imperial residence is, are of an uncommon strength, "all of freestone of an extraordinary size, which are "barely laid upon each other, without being fastened "either with mortar or braces of iron, which was "done, they say, that in case of earthquakes, which "frequently happen in this country, the stones yield- "ing to the shock, the wall itself should receive no "damage. Within the palace a square white tower rises "aloft above all other buildings. It is many stories high, "adorned with roofs, and other curious ornaments, which "makes the whole castle look at a distance magnificent "beyond expression, amazing the beholders, as do also "the many other beautiful bended roofs, with gilt drag- "ons at the top and corners, which cover the rest of the "buildings within the castle. The second castle is very "small, and more like a citadel, without any outward "ornament at all. It hath but one door, and there is but "one passage to it, out of the Emperor's own residence, "over a high long bridge. The third castle lies on the "side of this second, and is much of the same structure. "Both are enclosed with strong high walls, which for a "still better defence are encompassed with broad deep "ditches, filled by the great river. In these two castles "are bred up the Imperial Princes and Princesses, if "there be any. Behind the Imperial residence there is "still a rising ground, beautified according to the coun- "try fashion, with curious and magnificent gardens and "orchards, which are terminated by a pleasant wood at "the top of a hill * * *."

Such is Kæmpfer's description of the Castle in the time of Tsunayoshi, the 5th of the Tokugawa Shôguns (1680—

Digitized by Google

1709). A glance at the accompanying plan will show how accurate are his observations, and it is a matter for surprise that, with the limited means at his disposal, he should have been able to acquire such correct information. The Shôgun's palace itself was on the rising ground in the Chief Enclosure, and what Kæmpfer terms the "Third Castle" was in reality the Western Enclosure, to which allusion has already been made, on the height just within the Outer Sakurada Gate. What he styles the "Second Castle" was the enclosure of the Shrine dedicated to Iyéyasu, in the clump of trees crowning the Momiji-yama, adjoining the Western, and immediately behind the Chief Enclosure. The approach to it was along the high stone causeway leading from the Hasu-iké Gate. When Iyéyasu first entered the Castle, a small Sannô shrine stood just outside it, near the plum forest at Bairin-zaka. This shrine he moved to the summit of Momiji-yama, and his son and successor Hidétada further beautified and adorned it. Hidétada's son, Iyémitsu, during his father's lifetime, erected in the rear of this shrine a smaller one to the memory of Iyéyasu; and upon Hidétada's death, Iyémitsu removed both these buildings to other localities, and built in their stead a far larger shrine, which he dedicated to his deceased grandfather. The Western Enclosure alone was occupied by the heir apparent of the Shôgun. In the Chief Enclosure, just at the back of the Palace, was situated the Treasury. This consisted of three large godowns, (still standing) shut in by the Castle rampart at the back, and in the front by a strong stone wall of semicircular shape projecting into the ground adjoining the Palace. The sole entrance was through a small, low gateway of heavy timbers, and from the wall at the back there was a sheer descent of about 60 feet to the moat below, the position being thus rendered one of the most secure in the whole of the structure. At the foot of the large five-storied tower, and immediately between it and the northern drawbridge, was an archery ground, and the rest of the enclosure was occupied by the Palace itself, surrounded by small palisades.

Digitized by Google

The Palace seems to have been nothing more than the ordinary style of building such as may be seen in the centre of any *Daimiô's* mansion. It was one-storied, but tolerably high. At the very entrance was a waiting-room, and next several larger apartments, used as Council Chambers, each of which bore a special name. Beyond these was the grand hall of audience, the floor of which was said to contain one thousand of the ordinary Japanese mats (6 feet by 3). The posts and beams throughout the building were all of plain wood, of a peculiarly delicate grain, and free from knots,—the sliding screens used as partitions were covered with fine paper on which were traced various pictures and elegant designs,—and the ceilings were also of finely-grained planks. Kæmpfer also observes,—"I was told that there is a particular "private apartment under ground, which instead of the "ceiling hath a large reservoir of water, and that the "Emperor repairs thither when it lightens, because they "believe that the force of lightning is broke in the water. "But this I deliver only upon hearsay." The residence of the Heir Apparent, in the Western Enclosure, was of much the same description, only smaller in size.

The Fukiagé gardens, in the rear of the two enclosures, are now familiar to all foreign residents in Yedo, as they are opened to the public on fixed days. They contain some truly magnificent trees, long stretches of turf, artificial mounds, miniature cascades, and elegant little pavilions. There is also a small lake, and in two or three places are short courses for exercising horses. From the highest of the mounds may be obtained, in clear weather, a fine view of the summit of Mount Fuji. The old name for the gardens was Tsubouné-sawa, indicating a marshy piece of land overlooked by the ladies' apartments, which were apparently situated in the rear of the Palace. The name Fuki-agé is commonly given to any raised plateau or high ground overlooking the sea or a river, and is applied to several other localities of that description in different parts of Japan. These gardens were first laid out in the time of Iyéyasu.

Digitized by Google

The *yashikis* of a few of the greater *Daimiôs*, or territorial nobles, and of nearly all of the members of the *Gorôjiu*, or Chief Council of the Shôgun, were situated in the space between the Outer Sakurada and Watagura Gates,—the second of Kæmpfer's "fore-castles." Those of the other *Daimiôs* filled the first "fore-castle,"—from the Hitotsubashi to the Sukiya Gate,—and also the space enclosed by the outside moat, from the Yamashita Gate to the neigbourhood south of the Kôji-machi,—the broad street connecting the Hanzô and Yotsuya Gates. From the Kôji-machi round to the Suji-kaë Gate dwelt the *Hatamotos*, or petty feudal nobility of the Shôgunate, and other immediate vassals (styled *Goké-nin*) of the Tokugawa family. The mercantile quarter extended from the Sujikaë Gate down to the sea, but there were a few townspeople's houses just outside of the Tayasu Gate, and also on both sides of the Kôjimachi. The latter were specially admitted for the purpose of providing supplies of provisions, etc., to the nobles and their retainers. In the city beyond the outside moat there were also dispersed here and there the smaller *yashikis* of many of the *Daimiôs*, and a very considerable number of those belonging to the *Hatamotos*, etc.

The rules and observances laid down for the general superintendance of the Castle were very numerous, and are given in minute detail in the "*Tonoi-bukuro*." The chief regulations referred to the guards at the different gates. Just inside each gate stood a long wooden shed, or guard-house, where bands of men were on duty both by day and night. These guard-houses were hung with curtains, changed daily, bearing the badge or cognizance of the Captain of the Guard for the time being. Pikes were planted in the ground immediately in front, and within the sheds were kept richly lacquered matchlocks, spears, and bows from the arsenal of the Shôgun himself, more for purposes of show than of defence. The guards varied considerably in number, according to the importance of the position; some few were posted in the small square enclosure of the gate, while the greater portion remained

Digitized by Google

in the guard-house within. In the very centre of the Castle, below the Palace and at some few other guard-houses, the men were always chosen from among the *Hatomotos* and the *Goké-nin*. Between the Ôté-san-no-gomon and the last gate leading to the Palace was posted the so-called *Hiakunimban*, or "Guard of one hundred men" (in reality, it was one hundred and twenty), while the smaller gates further in were held by from thirty to seventy men apiece. At the other gates throughout the Castle, the guards were furnished by the *Daimiôs*, and in some few instances by the *Hatamotos*, according to the amount of the estimated total yield of their fiefs;—the number varied from ten to three men in each guard, not counting a few inferior soldiers who performed the office of opening and closing the gates as ordered. The above was the ordinary force, but on the occasion of festivals, of the *Daimiôs* going to Court, or of the Shôgun himself proceeding forth from the Castle, it was increased considerably, in some cases to as many as three times the ordinary number of men. There was no fixed rule as to clothing, but black seems to have been the colour usually worn; some slight difference was made at festivals. According to the "*Tonoi-bukuro*," the total number of guards under arms daily at the various gates was about three hundred and fifty; thus, on special occasions, they must have been considerably in excess of that force. At the Ôté Gate, by particular rule, no one was suffered to pass, without very strict examination, after 9 p.m.; but at the other gates the regulations were not so stringent. They were generally closed at dusk, but anyone could easily gain admittance upon stating the title of his lord, and his own name, which were written down in a book kept at the guard-house for that purpose.

Next in importance to these guards at the gates came the Castle fire brigades. They were very numerous, and each had a certain portion of the enclosure committed to its care. The men were all direct vassals of the Shôgun, the chiefs of the different companies being *Hatamotos*. Each fire brigade had its special standard, and a distin-

Digitized by Google

guishing mark for the lanterns borne by its members. This mark consisted as a rule of differently coloured lines painted on the lanterns, to which was usually added the badge of the chief of the company. Uniform mantles were also worn, and to each company was assigned a separate watch-house, where the fire-ladders and other implements were kept. A code of signals, by means of flags, was also arranged, so that the precise spot in which a fire had broken out might at once be made known with exactness.

Apart from the above there were two officials styled *bugiô*, whose duty it was to see that order was maintained within the Castle enclosure, and to look after all matters of minor importance. They had offices in different spots, and a large number of men were placed under their command. It is, however, impossible here to give full details regarding the various duties assigned to these men, nor as to the rules for their dress, etc.,—some of which were of exceedingly trivial nature.

On the 1st, 15th, and 28th days of each month all the *Daimiôs* went to Court to pay their respects to the Shôgun; and, as a matter of course, they also did so on the occasion of any exceptional event or grand festival. Upon passing through each gate, the nobles had to open the windows of their *norimono* or palanquins, but no salute was given to them by the guards. At the main gates leading to the Chief and the Western Enclosures were posted notices, requiring all but specially privileged personages to dismount from their horses or litters and proceed on foot up to the entrance of the Palace itself. These notices were styled *géba*, and in addition to the two gates above mentioned, were also erected later on at the Outer Sakurada, Sakashita, and Hirakawa Gates, and in 1795 at the Hitotsubashi Gate likewise. Upon reaching the Palace the *Daimiôs* were ushered into different apartments, according to the estimated total yield of their several fiefs, and were afterwards conducted to the Hall of Audience where they paid their reverence to the Shôgun. On these occasions each noble took with him a

Digitized by Google

numerous following of retainers, who were clad in dresses of ceremony, and bore lances, halberds, staves with tufts of black feathers, large umbrellas, and various other insignia of feudal state. Some of these trains were of great length, and formed an imposing sight as they marched along the broad causeways. While the *Daimiô* was within the Palace, the greater portion of his attendants waited just outside the chief entrance. It would seem as though the outer works of the Castle had been constructed quite as much to favour these displays of pomp and state, as for actual defence,—for a show of strength and power, as for real military purposes.

To certain favoured individuals special privileges were from time to time granted by the Shôgun. Foremost amongst these was the one already noted as having been accorded to the Abbot of Zôjôji, namely, of riding in his litter up to the very entrance hall of the Palace, instead of dismounting at the usual place. Apart from the Abbot, this was the right of the *Gosan-ké* and the *Gosankiô*, the "Three Princely" and the "Three Noble" houses allied to that of the Shôgun, and also of the members of the *Gorôjiu*, or Chief Council, and the Regent of a Shôgun during his minority. These high personages likewise received a salute from the guards at each gate, which was always scrupulously returned, the windows of the litter being kept open. The Shôgun himself, when going forth, did not return such salutes in the case of guards chosen from his own immediate vassals, but whenever he passed a guard house where the men were retainers of a noble whose assessment amounted to 10,000 *koku* and upwards, he always addressed a few words of courtesy to them. It was an ancient privilege of the retainers of the lords of Sendai to march through the Asakusa Gate, on their way to or from their Castle-town, with slow matches attached to their match-locks. This privilege may perhaps have originated from the fact, as above narrated, of the *Daimiô* of Sendai having widened and rendered navigable the moat from above the gate in question to the Kanda River. The "*Tonoi-bukuro*" mentions that in 1808

Digitized by Google

this privilege was disputed. In the 2nd month of that year three retainers of Mutsu no Kami, the *Daimiô* of Sendai, came to Yedo on business connected with their young lord's succeeding to the title, on which occasion, as they were passing the Asakusa Gate with matches attached to their matchlocks, they were stopped at the large guard house. The old placard formerly standing at the gate, on which was recorded the fact of the privilege being granted, had been destroyed in the great fire of 1772, and the guards were apparently ignorant of the usage. The three men, however, stood out boldly for their right, and the matter having been referred to the proper authorities, was finally determined in their favour. And again, at the great festival of Sannô (which shrine is now situated within the outside moat, just below the Akasaka gate) which took place in the 6th month of every second year, the procession was, by special privilege, permitted to pass through a certain portion of the Castle enclosure.

Of the visits of foreigners to Yedo Castle in early days, but little is known, and it is probable that these were few and far between. Will Adams, the first Englishman in Japan, lived, however, in the city for a considerable time in the opening years of the 17th century, during which period he is stated to have been frequently about the Court of Iyéyasu. In 1614, there also came to Yedo a Dutchman, who, as the "Yedo Meisho" says, was named Yan-yôsu-hachiku'an (Jan Josef———?). He presented to the Shôgun two young tigers, and there was bestowed upon him the strip of land alongside the moat from the Watagura to the Hibiya Gate. This spot still bears the name of Yayosu-gashi. Another work relates that the person in question "was a barbarian who showed great fidelity (to the Shôgun) at the time of the prohibition of Christianity by the Government." In later times the Dutch commissioners were frequent visitors to the Castle, and were granted audiences at the Palace:—a graphic description of one of these ceremonies is given in Kæmpfer's "History of Japan." Special mention is made, too,

Digitized by Google

in Japanese works, of a Corean Embassy which arrived in the year 1711. To impress these strangers with a due sense of the extent and magnificence of the Castle, a fresh gate was purposely erected, in 1710, just to the north of the bridge called Shimbashi, that being the main roadway by which the Embassy was to enter Yedo. This gate was styled, from the name of the locality, the *Shiba-guchi Go-mon*, it was constructed at Government expense, and rendered complete the outside moat by closing the whole of the horse-shoe shaped enclosure of the castle. It is to be found marked on very old maps of Yedo, but it was burned down in 1724 and never rebuilt. The Coreans were lodged in the old buildings formerly occupied by the temple of Zôjôji, just outside the Watagura Gate, and within this gate there was constructed a race-course, where the Shôgun "was pleased to witness, from a pavilion, the Coreans' archery on horseback." After this, there was built here the Babasaki Gate, which took its name from the race-course: it originally stood at the corner just opposite the Hibiya Gate, but having been burned in 1772 was re-constructed lower down, on its present site. In more recent times, consequent upon the development of Japan's relations with foreign countries, the Representatives of the various Western Powers were from time to time received at the Castle by the Shôgun,—and, since the revolution of 1868, by the Mikado himself. Out of these visits of foreigners it will be sufficient to notice here the reception of H. R. H. The Duke of Edinburgh, who paid a visit to the Emperor on the 4th of September 1869. The Duke was received by His Majesty in the Fukiagé Gardens behind the Chief Enclosure of the Castle.

In a locality so subject as is Yedo to large conflagrations, the Castle could hardly hope to escape unscathed. Great damage was constantly caused to it by fire, and it was certainly for no mere show that the numerous fire-brigades above mentioned were enrolled. In the great fire of 1657, the Castle was almost entirely consumed; in 1772, four of the gates were completely destroyed; and

Digitized by Google

since the year 1844 the Chief Enclosure was burned no less than three times,—the last occasion being in 1863, after which the Palace was never rebuilt—and the Western Enclosure three times likewise. Whenever the Chief Enclosure was destroyed, the Shôgun used to remove to the smaller Palace in the Western Enclosure; but in 1863, when both had been burned at very nearly the same time, he lodged for a while in the *yashiki* of the Shimidzu family, and afterwards in that of the Tayasu family. The task of rebuilding was generally performed by the Government, but in a work entitled "*Kindai Geppiô*" it is noted that in 1859 "the various *Daimiôs* were called "upon for contributions in consequence of the destruction "by fire of the Castle." The Mikado's Palace in the Western Enclosure was finally destroyed on May 5th 1873,—five years after the Castle had been abandoned by Keiki, the last of the Tokugawa Shôguns—and since that time His Majesty has resided in the former Kishiu *yashiki* just outside the Kui-chigai Gate. In addition to fires, severe damage has been inflicted from time to time by earthquakes. In 1647 the Castle and many of the residences of the *Daimiôs* were overthrown; and again, in 1702, the walls of the outside and inside moats were destroyed. So lately as six years ago, an earthquake threw down a portion of the parapet placed above the ramparts between the Hanzô and Outer Sakurada Gates.

The annals of Yedo Castle are rich with incidents of interest. Apart from the various points to which attention has been called above, there are numerous other events, sufficient to form a very large collection; and amongst these are peculiarly noticeable many a deed of bloodshed, and many a tragic scene enacted within its limits. Not even the sacred precincts of the palace itself were free from violence and murder. Here it was that, in 1649, Sakai Iwami no Kami, lord of the castle of Matsumoto in the province of Shinano, was attacked and mortally wounded, in a chance quarrel, by Hotta Kôdzuké no Suké, lord of Sakura in Shimôsa,—the *Daimiô* whose cruel oppression of the peasantry on his estate is so well-known a

Digitized by Google

theme of Japanese tale. And it was in the Palace likewise that, in 1701, Asano Takumi no Kami, lord of Akô in Banshiu, stung to fury by the insults heaped upon him by the noble Kira Kôdzuké no Suke, inflicted a wound upon the latter,—thus bringing about, a short while after, the avenging deeds of the famous "Forty-seven *Rônins*." It may be remarked, in passing, that death was the usual penalty to which any one guilty of a deed of violence within the Palace was sentenced. Again, the open space immediately without the Outer Sakurada Gate was, on the morning of March 23rd, 1860, the scene of a desperate fight, in which an attack was made by seventeen men of the Mito clan upon the train of Ii Kamon no Kami, lord of Hikoné in Ômi and Chief Minister of the Shôgun. The cause of this affair was the harsh treatment to which the old *Daimiô* of Mito had been subjected by Kamon no Kami; the latter and many of his retainers were killed in the fight, while of their assailants some were cut down on the spot and some executed later on. Just below the Sakashita Gate, Andô Tsushima no Kami, lord of Taira in Ôshiu and one of the then Ministers for Foreign Affairs, was on February 11th, 1862, assailed and wounded by some retainers of a *Hatamoto* named Hori Oribé no Shô. On March 26th, 1872, a very strange affair ocurred at the old Ôté Gate. At daybreak on that morning, ten fanatics, clothed in white garments and carrying long staves in their hands, came by boat to the Kaji-bashi Gate, and then went on as far as the Ôté Gate, which they imagined to be the entrance, as of old, to the Palace. When challenged by the sentries they replied that they had a direct complaint to lay before His Majesty, and upon admittance being refused they endeavoured to force their way in. They succeeded in reaching the open square between the two gateways, and then with swords and staves tried to force their way through the inner gate. Upon this, the guards fired on them, and out of the ten men four were shot dead on the spot, one mortally wounded, and the five others arrested. And, lastly, the Prime Minister Iwakura was

Digitized by Google

attacked and wounded, on the night of January 14th, 1874, just outside the Kui-chigai Gate, by fourteen men, who eventually proved to belong to the province of Tosa. These men were soon afterwards arrested, tried, and executed.

Since its surrender by the house of Tokugawa into the hands of the Imperial family in 1868, the Castle of Yedo has undergone many a change. The Palace in the Chief Enclosure has never been rebuilt, and that in the Western Enclosure (burned in 1873) is not yet reconstructed. The former site of the chief Palace is now a bare open space, overgrown with weeds, and containing merely a few small earthworks, palisades, and ditches for the drill of the troops quartered in the large barracks hard by. The Treasury godowns still stand intact, and there yet remains one tower, of three stories, on the height overhanging the Hasu-iké Gate. The lofty keep, the long lines of guard-houses along the ramparts, and the other buildings of minor importance, have all disappeared; and with the exception of a small tower at the corner just below the Inner Sakurada Gate, and another in the Western Enclosure, just above the former entrance thereto, there remains throughout the whole of the Castle nothing but the stone-faced embankments and moats to mark the old lines of defence. Numbers of the gates have been pulled down, the stones from the foundations being applied to purposes of building elsewhere; and in some places stone bridges have been erected in the stead of the wooden ones hitherto standing. These stone bridges are all thrown across the very outside moat on the town side, where the throng of traffic and passengers is especially great. Some bridges have disappeared for ever, while here and there fresh ones are in process of erection; large parade-grounds have been marked out on the sites of the former *Daimiôs'* mansions; many of these buildings which yet remain, are used as Government Offices or converted into barracks for soldiers; while on all sides have sprung up edifices in foreign style, of every imaginable shape and size. Offices, pri-

Digitized by Google

vate residences of officials, police-stations, barracks, etc., are to be observed at each turn; and as the ancient *yashikis*, whenever they are destroyed by fire, are never rebuilt in their former style, it is highly probable that ere a few years have passed there will be left hardly a vestige of the old style of architecture within the Castle enclosure. One or two of the gates, however, being those through which His Majesty generally passes when on his way to the Council of State, etc., have been ordered to be kept in repair, and thus there are preserved a few samples of the ancient fortifications. But the beautiful gardens still exist as heretofore, and are the resort of crowds of visitors on the public days of admission. Everything here remains unaltered, the only modern innovation being a small suspension bridge thrown across the deep moat at the back of the Western Enclosure, so as to form a shorter passage from the Palace into the gardens. This was constructed some five years ago, while the Mikado still occupied the Western Enclosure. Whether a new Palace will ever be erected there is unknown, but it is certainly one of the best sites in the whole city. The gardens have lately been used on several occasions as a review-ground for troops.

The above remarks contain as brief a history of the Castle as is possible. These notes could not be extended further without bringing into this paper a great deal of outside matter not properly appertaining to it,—such as items relating to the general history of the City of Yedo itself. The city will continue to thrive and increase, but with the Castle the case is different. The old fortifications are no longer needed, and as there does not seem to be any earnest desire on the part of the Government to keep them in their former condition, it is to be feared that the space of a few years from now will see many a change for the worse as far as their state of preservation is concerned. But in proportion as these old monuments of bygone ages decay and fall into ruin, the more valuable and interesting do they become when regarded by the eye of the antiquary. And in this latter respect, if in no other,

Digitized by Google

the Castle of Yedo will always merit special attention, from its intimate connection with the history of this country, and from the memory of its former pomp and state when under the sway of the ruling families of Japan.

Digitized by Google

ASIATIC SOCIETY OF JAPAN.

A General Meeting of the Society was held at the Tôkiyô Dai-Gaku, on Saturday, December 22nd., Sir Harry S. Parkes, President, in the Chair.

The minutes of the previous Tôkiyô meeting having been read and confirmed, it was announced on behalf of the Council that it had been determined to recommend to the Society the alteration of rule 26, changing the number of separate copies of a paper to be printed, to 50. This was put to the meeting and carried unanimously.

It was announced that Dr. Thos. H. Tripler had been elected a member.

The Corresponding Secretary stated that he had received an invitation from Mr. Davis, of the Museum of Comparative Zoology, Cambridge, Mass., to exchange transactions.

Dr. Murray stated that the Vice-Minister of Education had offered the Society the use of a room at the Tôkiyô Shoseki-kuwan for their meetings. It was now used by the Tôkiyô Mathematical Society, and together with the Recording Secretary, he had visited it, and found it in every way suitable. He proposed that the offer be accepted, and thanks be given to the Vice-Minister for his offer. This was carried unanimously.

Mr. McClatchie then read a paper on "The Castle of Yedo."

Dr. Murray called the attention of the Society to a map of Yedo believed to represent the condition of the locality at the time of the founding of the castle by Ôta Dôkuwan. He said that the grandfather of the present owner purchased it in a book stall. It is much injured by the weather and by insects, but is still entirely decipherable. It has on it several inscriptions, one originally engraved on the block and the others subsequently. The original inscription is as follows :—

"This map of Yedo during the period Chôroku (1447-1460) was originally in the possession of Ôkubo, and it was copied by Se Sadao during the reign of the Emperor Go-Hanazono-in (1429-1464) and the Shôgunate of Ashikaga Yoshimasa (1448-1472).

"The Castle of Yedo was built by Ôta Dôkuwan who was the chief-retainer of Uyesugi Sadamasa, Governor of Kuwantô. He began the work in 2nd Kôshô (1456) and ended it on the 8th of 4th month of 1st Chôroku (1458)."

The date here assigned for the building of the Castle accords with that stated by Mr. McClatchie in his paper. And as the period when Se Sadao is said to have copied the map,

Digitized by Google

viz., the reign of Go-Hanazono, ended with 1464, and the map had existed in manuscript before that, it is quite certain that it relates to a time little subsequent to the building of the Castle, and may be without improbability the map of the vicinity made at the time it was laid out.

Another inscription relates to the manner in which the map was preserved. It runs as follows:—

"THE MAP OF YEDO DURING CHÔROKU.

"This map seems to have been in the possession of my ancestor and published by him many years ago. In the course of years the wooden block on which it was engraved came to be used as a shelf in a closet. Last year when a carpenter had taken down the shelf in order to make some changes in the room, he found the map cut on the block not injured except by some marks of nails If I had put the shelf back as it was, it would have been of little service, hence I have mended the injured spots and put it again to its proper use, hoping that everybody will from this be able to understand the origin from which the present prosperous city sprang!

"*N.B.*—If any map shall differ from this even in a single point, it must be a counterfeit.

"Ôta Tokitoshi, his private property.

1st month of 4th Kokuwa (1847)."

Taking the last year of Chôroku as the date of the map, it is now (1877) probably 417 years old, and believed to be the oldest authentic map of Yedo extant. There are other old maps of Yedo, one known as the *Keichô Map* (about 1596), and another the *Shô-hô Map* (about 1644.)

The most striking points in this representation of Yedo in its early days are, *first*, that at that time the present city was a large number of separate villages. Thus we have Kanda-mura, Yushima-mura, Hongô-mura, Ushigome-mura, etc., which then were distinct communities, but which subsequently were merged into one large town, the districts of which, however, perpetuate the village names.

A *second* noticeable point is the large area which since that time has been reclaimed from the water. Many of the streams which then spread out in broad marshy ponds have been turned to use in supplying the Castle moat with water, or have been excavated and made to do duty as navigable canals. The site of the present University is here represented as covered with a pond of water formed by the expansion of the Kanda river. Since that time this river has been made in part to feed the moat and furnish a supply of water for the city, and the remainder provided with a new route to the Sumida river through the deep canal constructed by the *Daimiyô* of Sendai. The whole of the area now occupied by Tsukiji, the garden of Hamagoten and portions of the shore near the Shimbashi Station and southward, was still at the date of this map covered by water. The change has doubtless been produced partly by natural causes and partly by human agency. The rivers emptying into the head of Yedo Bay bring down with them vast quantities of detritus, which thus have in time materially shifted the shore line. He had been told by a gentleman resident in Tsukiji, that even within the past four

Digitized by Google

years a great increase in the length of the sand spit at the river's mouth has been observed. The natural growth of the land was doubtless assisted by artificial means at some period, a fact which is preserved in the name Tsukiji, which means made ground.

There is a dotted line drawn across this map which is said to represent the route by which the famous hero Yoshiiye, often known as Hachiman-tarô, i.e. the eldest son of the God of War, marched when on his expedition against the Northern barbarians, who under the leaders Takehira and Iyehira were defying the Imperial authority. The expedition took place in 1091, and is a favorite subject of Japanese art. There is in the Asakusa library a famous picture in the Gosé style, which he had seen, illustrating this expedition.

He would only add further, that with all due deference to the opinion of the gentleman who rescued this valuable map from the ignoble position of a shelf for his closet, he could not quite accept his claim for it of infallibility. He had made various efforts to compare it with others of known accuracy, but the distances are utterly unconformable. Taking the Castle, however as a centre, the directions towards various prominent objects are reasonably correct. Hence, he hazarded a conjecture that the general draft of the map was made by sketching from the heights of the castle, with little or no checking by means of measurement of distances. Taking it all in all, however, he thought it might be regarded as a valuable record of the history of Tôkiyô, and trusted the members would pardon him for the time he had taken in giving an account of it.

Dr. Veeder remarked that the reference made in the paper to the widening of the deep moat known as the Sendai Hori by the *daimiyô* of Sendai, suggested a question which he hoped that Mr. McClatchie or some other gentleman present might be able to answer. It was well known that the current tradition in Yedo is that the *daimiyô* of Sendai was compelled to execute this great work at his own expense, as a penalty for a grave offence against the Shôgun. This was the account he had repeatedly heard given of the matter during the first four years of his residence in Tôkiyô. But on visiting the locality about two years ago in company with the late Mr. Hatakeyama, the former Director of the University of Tôkiô, he was informed by him that this tradition was wholly an error; and that the truth appeared to be that the Shôgun, observing that the *daimiyô's* wealth and power were growing so great as to threaten to become a source of danger to the Shôgunate, sought at once to cripple to some extent the resources of the *daimiyô*, and greatly to strengthen his own Castle, by imposing upon him a task requiring the labour of a vast number of men and a large expenditure of treasure. Such a task was the widening of the canal referred to. It appears, also, from Mr. McClatchie's own statements respecting this matter, that the execution of this work, so far from being a penalty, was probably to some extent a voluntary work, in recognition of which certain distinctive privileges

Digitized by Google

were conferred upon the *daimiyôs* of Sendai and their retainers. If Mr. Hatakeyama's statements were correct, the performance of such a vast work in obedience to an absolute command, would be an interesting illustration of the absolute authority wielded by the Shôguns, and the implicit obedience rendered to that authority even by the most powerful princes of the empire. The question which he wished to ask of the author of the interesting paper to which they had listened was, whether in his investigation on the subject he had met with any trustworthy historic statements in relation to this point.

Mr. McClatchie in reply said that he had also heard the explanation give by Dr. Veeder, but as the members were aware, it was a most difficult task to verify a statement of such a nature. He had said in his paper that the privilege accorded to the retainers of the *Daimiyô* of Sendai of passing through the gates with lighted fuses attached to their matchlocks, had "probably been given in return for the service rendered," but this was only a conjecture on his part.

Mr. Satow exhibited a Japanese printed book entitled *Ô Yedo Dzusetsu Shûran*, containing maps of Yedo of the periods 1558-1570 and 1624-1644. From the former it would appear that little change had taken place in the general character of the locality since the period described by Dr. Murray, but the second showed that in less than a century the city had assumed a great size.

The President observed that the labour and care which Mr. McClatchie had devoted to the subject of the paper would be fully appreciated by the Society. We learned from it that the principal growth of the city of Yedo was the work of little more than a century, that it was only a place of small extent at the end of the sixteenth century, and that a hundred years afterwards it had expanded to the large dimensions described by Kaempfer, which were scarcely inferior to those of the present day. The political condition of the country at that period, which made Yedo the centre of the Empire, accounted doubtless for this rapid development. The history of Yedo from the time that it passed into the hands of Iyeyasu might be said to be the history of the country itself, and the Castle, with its extensive walls and picturesque moats, formed probably the most durable monument of the genius and power of that great master-mind, which the country possessed. It was obvious, therefore, that any information that could be obtained, not only as to the construction of the city but also as to its traditions and the events which had occurred within its walls, would throw light on the recent history of Japan, and it would be seen, therefore, that the subject of the paper suggested a wide field of interesting and useful enquiry. He concluded by moving a vote of thanks to Mr. McClatchie, which was carried by acclamation.

The meeting was then adjourned.

Digitized by Google

KAK'KÉ.

BY

WILLIAM ANDERSON, Esq., F.R.C.S., England.

Read before the Asiatic Society of Japan, on the 12th January, 1878.

Some apology is due to the members of the Association for bringing before them a paper on a medical subject, but as the disease under consideration is peculiar to the East and is unlikely to excite much interest in Europe or America, even in professional circles, the fittest vehicle for its introduction to general and medical notice should be the journal of the *Asiatic Society's Transactions.*

The following description is founded upon notes of about 1,100 cases,—it is not offered as an exhaustive account of the malady, but as an embodiment of the principal results of four years' observations, to which the writer is anxious to add the experience of others.

The details have been freed from technicalities, as far as the nature of the subject will admit, with a view to making them intelligible to all who may desire to know something of the nature of a condition that must frequently come more or less immediately under the notice of every resident in Japan.

Kak'ké is a disease known by name to almost every native and foreign resident in this country, but its real nature and origin are but little understood even by those most

Digitized by Google

concerned in its prevention and cure. To the general public the word appears merely to raise a vague conception of some form of dropsy, engendered in mystery and living in defiance of the faculty—and yet the complaint prostrates yearly tens of thousands of the population of the three great and many of the smaller towns of Japan.

The name is derived from the words '*Kiyaku*' and '*ki*' or '*ké*,' the Japanese pronunciation of two Chinese characters signifying 'an affection of the legs.' An analogous or identical complaint is known in India, Ceylon and South Brazil under the name of Beriberi.

The history of the disease in Japan is obscure, but the malady probably was not sufficiently prevalent to attract much attention until the beginning of the last century. Its earliest description is found in the 'Zatsu biyô kibun' published in Kiyôto in 1715 by a physician named Tachibana Nanke, but it is not referred to in the great Japanese Encyclopædia, the 'Wakan sanzai dzuye' published in 1714, and Kæmpffer, who wrote in 1692, makes no allusion to it. For its first introduction to the notice of foreigners we are indebted to Dr. Hoffmann's account in the July 1873 number of the Transactions of the German Asiatic Society. Other articles have been since published in European medical periodicals by Dr. Wernich and the present writer.

The description by Tachibana Nanké, which is still considered the best in this country, is very curious and interesting, but its usefulness is greatly limited by the perverted system of thought that has led the author to waste intellect and opportunity by groping after tortuous explanations of natural and morbid phenomena in the misty influences of the *in* and *yô*, and the complex interrelationships of the five pseudo-elements of Chinese philosophy, to the neglect of close observation and scientific research. The summary of the characteristics of the complaint is the most practical and valuable part of the essay, and may with advantage be quoted.

"In considering the pathology of *Kak'ké* it will be found that the disease differs from other affections in seven points.

Digitized by Google

Firstly.—It makes its appearance in April or May, is severe during the rainy period of summer, ceases in September, and does not occur in the winter. *Secondly*.—It is very common in Yedo and Kiyôto, very rare in other places. *Thirdly*.—It almost always produces dropsy and numbness of the legs, but does not affect the face, arms, abdomen, or back. *Fourthly*.—The appetite is usually normal. *Fifthly*.—There is no fever. *Sixthly*.—The disease is more common amongst the lower classes, who are subject to hard work, and is very rare in the higher ranks. The officials who accompany the *Daimiyôs* in their yearly visits to Yedo, students, shop-keepers' assistants who are accustomed to keep the sitting posture for a long time continuously, suffer largely. *Seventhly*.—Although a patient with *Kak'ké* may for a time have little suffering, when once '*Shiyôshin*' (a name applied to shortness of breath, vomiting, etc,) appears, all medical treatment is useless."

Kak'ké may be defined as a specific disease endemic in certain low-lying towns of Japan and especially associated with over-crowding, bad ventilation, and bad drainage; most frequent during the prevalence of the South-west monsoon; non-contagious; capable of remaining latent in the system for long periods and of manifesting itself in places remote from its source; and tending to recurrence independently of a renewal of the primary causative conditions. The symptoms are uncomplicated with fever and are not necessarily associated with anæmia or general debility; they are characterized by localized partial paralysis of motion and sensation, dropsical effusions in various situations, and by a tendency to irritative phenomena of nervous origin in the voluntary muscles, heart, and stomach.

The cases may be arranged according to symptoms in three groups, Sub-acute, Chronic, and Acute, connected by intermediate forms, but these latter seldom cause any difficulty in classification.

The course of the disease may be most clearly illustrated by describing imaginary examples of the three groups,

Digitized by Google

after which the various symptoms will be treated individually.

The ordinary form of *Kak'ké* is the Sub-acute. A typical case will have a history somewhat as follows. The patient, a present or past resident in a *Kak'ké* district, finds that he is gradually losing the strength of his lower extremities. In walking, his knees feel loose (a sign usually expressed by the onomato-poetic word "*gakŭ-gaku*") and fatigue soon supervenes while persistence in the effort induces painful cramps in the calves. The heart palpitates from time to time without apparent reason; the legs swell, especially over the shin bone, and pressure here leaves a slowly disappearing impress; a sensation of numbness is noticed at the same time in the skin of the leg and foot. The fingers may also become numbed and feeble, causing a difficulty to be experienced in adjusting buttons and tying knots, and perhaps the lips and the lower part of the abdomen show a similar loss of sensibility. With these symptoms a condition of anæmia or general debility may or may not co-exist.

The leg-swelling after one or two weeks subsides and the numbness follows it at a later period, but the power in the extremities does not return and may even continue to diminish. It is in this stage that the patient most commonly comes under medical observation. On examination, his leg muscles are found soft and flabby; his grasp is so feeble that he can bring the index of a Dynamometer over only 5 or 10 instead of 30 degrees; on listening to the heart, hastened action and perhaps unnatural sounds are detected; and the pulse is frequent and of low tension; the appetite is, however, good and digestion is not specially affected. Under local and general treatment strength gradually returns, the functional disturbance of the heart ceases, and by the end of three to six weeks the patient is enabled to resume his occupation.

'Chronic' *Kak'ké* in its early stages usually resembles the Sub-acute form in most particulars, and occasionally may for a time be indistinguishable from it, the characteristic symptoms supervening gradually upon the ordi-

Digitized by Google

nary phenomena. Sooner or later, however, the patient suffers from severe and frequent spasm of the calf, and the muscles of the lower extremity become very tender, slight pressure causing considerable pain (muscular hyperæsthesia), while the superjacent skin possesses only the ordinary or perhaps a diminished sensibility. The cutaneous numbness and the œdema present at the commencement disappear but the muscular hyperæsthesia persists; the power of the limbs steadily diminishes, one group of muscles being commonly more affected than the rest; and a progressive wasting of the fibres sets in, producing a singular degree of emaciation of the parts attacked, while the rest of the body remains fairly well nourished. The upper extremities are also involved in nearly all cases, but to a less extent, and the hyperæsthesia is slight or absent—a peculiar claw-like deformity of the hand is sometimes seen as a result of the atrophy of certain muscles. Palpitation of the heart may be an obstinate and troublesome combination. The progress of the disease is very slow, but in the absence of treatment is generally sure, leading to death from paralysis and exhaustion in from 6 months to 2 and 3 years. Fortunately, however, remedies have been discovered which have a marked influence upon the degenerative process, and induce a perfect recovery even in very advanced cases.

In the third or 'Acute' form the grave symptoms may appear without warning, but nearly always develope in the course of a Sub-acute or Chronic attack. A patient comes under treatment for *Kak'ké* of apparently an ordinary character; he may be strong and well nourished and have no sign of anæmia; the disease progresses in the usual manner, and no evil is anticipated, when suddenly, rapid action of the heart, visible pulsation in the neck, and difficulty of breathing appear, with a distressing sense of constriction at the level of the lower ribs:—soon afterwards the patient vomits and while an observer unaccustomed to see the disease still apprehends no danger, the Japanese doctor recognizes the commencement of "*Shiyô-shin*" and predicts that the man 'will surely die.' During

Digitized by Google

the next few hours the breathing becomes more embarrassed, the pulsations of the heart more and more accelerated, and vomiting recurs from time to time. The patient, now can lie down no longer; he sits up in bed or tosses restlessly from one position to another; and, with wrinkled brow, staring anxious eyes, dusky skin, blue parted lips, dilated nostrils, throbbing neck, and labouring chest presents a picture of the most terrible distress that the worst of diseases can inflict. There is no intermission even for a moment, and the physician, here almost powerless, can do little more than note the failing pulse and falling temperature, watch life receding slowly from the extremities towards the trunk, and wait for the moment when the brain, paralysed by the carbonized blood, shall become insensible and allow the dying man to pass his last moments in merciful unconsciousness.

All acute cases are not, however, as terrible and hopeless as this. Sometimes difficulty of breathing and cardiac disturbance may exist for one, two, or three days without much change, and if these signs are at their commencement used as a warning, the progress of the condition may be arrested; but this opportunity lost, a peculiar change takes place in the patient's system which renders inert our most powerful remedies, and leaves the disease to pursue its fatal course unchecked.

The different symptoms may be for convenience classified as follows:

a. Those affecting the nerves of sensation.
b. „ the muscular system.
c. „ the circulating organs.
d. „ the respiratory organs.
e. „ the digestive organs.
f. „ the system generally.
g. Dropsical effusions will be described separately, but it will be necessary to refer to them in connexion with *c* and *d*.

a.—Affections of the Nerves of Sensation. Localized Diminution of the sensibility of the skin (numbness or anæsthesia).—This is one of the earliest and most characteristic signs of *Kak'ké* although it rarely bears any rela-

Digitized by Google

tion to the severity of the attack, and may disappear while the disease is stationary or becoming worse.

The situations most commonly affected are the lower extremities, especially below the knee; the upper extremities, especially the tips of the fingers; the lower part of the abdomen; and the lips. A feeling of numbness (*shibiré*) in the skin of the leg, distributed sometimes over one nervous area, sometimes over another, is very rarely absent and enables us to distinguish otherwise obscure examples of the complaint. A special instrument, the æsthesiometer, is used for measuring the degree of impairment which usually varies from 25 to 75 per cent. of the normal sensibility. Absolute anæsthesia is very uncommon.

Increased sensibility of voluntary muscles.—The natural sensibility of muscle is very blunt, the healthy structure may be pinched and even pricked and cut without the production of acute suffering, but in *Kak'ké* (as well as in some other affections) there may be more or less hyperæsthesia, varying in degree from a trifling exaggeration of the normal sensitiveness to a condition which renders the slightest pressure intolerable. Its usual seat is the calf of the leg. In its higher degrees it is accompanied by severe cramps in the affected muscles which soon become the subject of a progressive wasting. In its early stages it is associated with numbness of the skin, but this soon disappears.

Pains in and around the joints are sometimes complained of and may become chronic. These are probably rheumatic in origin.

b.—Affections of the muscular system.—The voluntary muscles are liable to hyperæsthesia (already described), paralysis, spasm, atrophy, and hard interstitial growths.

Paralysis is a characteristic symptom of the disease; it is distinguished by its slow onset, partial character, and its localization to certain groups of muscles. It usually shows itself earliest in the lower extremities, commencing with a sensation of looseness in the knee joints and an inability to walk far without fatigue. If the case

Digitized by Google

progresses, the power of locomotion still further diminishes, and at length the legs will no longer bear the weight of the body; absolute paralysis, however, does not occur except in extreme examples of the Chronic form. The upper extremities are nearly always involved at the same time, but the slighter degrees of loss of power generally escape the patient's attention and are detected only by special examination. The condition is usually, but not invariably, proportionate to the affection of the lower extremities and is symmetrical in all but exceptional instances. An instrument, the Dynamometer, is used for estimating the power of grasp, and may be applied also for testing other actions; it is of great value for showing the daily progress of the disease. The average loss of strength when the patient comes under treatment is about 50 per cent., but the possible range is infinitely extended. In rare cases the vocal muscles may be affected and the voice weakened or lost, or speech may be rendered indistinct by implication of the muscles of the lips or tongue. The muscles of the chest and of the outlets of the body are apparently exempt. The muscles of the lower extremities, especially of the calves, become peculiarly flaccid in many cases.

Spasms or *Cramps* are rarely present except in the muscles of the calves. Occasional cramps of the legs are complained of in more than half the cases, but when frequent and severe they are always associated with muscular hyperæsthesia.

Atrophy has been already referred to as a concomitant of hyperæsthesia and cramps, and is rarely present unless so allied in the lower extremities, but the muscles of the forearm may waste without alteration of their sensibility, and spasmodic contractions here very seldom occur. Special groups of muscles are sometimes selected, as those of the back of the forearm, the ball of the thumb, sole of the foot, etc., and curious deformities may result from unbalanced action of the unaffected or less affected opponents.

Indurated growths in the muscles of the calves are seen

Digitized by Google

in about one out of every two hundred cases. They disappear as the other symptoms amend.

c.—Affections of the organs of circulation. Palpitation of the heart is present in about 60 per cent. of the cases. It is not usually associated with the visible signs of anæmia and is sometimes absent where marked anæmia is apparent. It does not cause much distress in ordinary instances, but occasionally may be augmented to a terrible degree without any obvious cause, inducing the most intense suffering and even leading to exhaustion of the overtasked organ, and death.

Visible pulsation in the neck and sometimes over the region of the heart precede and accompany most cases of *Shiyôshin.*

Abnormal sounds (murmurs) accompanying the pulsations of the heart are very common, and may closely simulate the "murmurs" audible in many organic cardiac affections. Such sounds are commonly termed 'anæmic' but they appear quite independently of the signs of anæmia, being often present when these are absent and *vice versâ.* They invariably disappear under treatment. It is noticeable that 'murmurs' like those of organic heart disease are very common amongst the Japanese in connexion with temporary disorders of health, and lead medical men who have not the opportunity of keeping their patients under observation for a long period to believe that cardiac valvular affections are very frequent in this country.

Dropsical effusion into the 'pericardium' (the sac which surrounds the heart and by means of its smooth opposed surfaces prevents any sensible friction during the movements of the organ).—This is one of the most dreaded complications of the disease, but its position amongst the causes of death has been exaggerated. The symptoms induced are those of great embarrassment of circulation with secondary disorder of the respiratory functions, together with certain physical signs detectable by a careful examination. It is one of the causes of *'Shiyôshin.'*

Inflammatory affections of the heart have been some-

Digitized by Google

times described in connexion with the complaint, but I have never met with satisfactory evidence of these: inflammatory diseases, sometimes, however, arouse a dormant *Kak'ké*.

d. Affections of the organs of Respiration.—The lungs are not specially implicated in *Kak'ké* except from local dropsy or from congestion secondary to circulatory disturbance. There is no connection between *Kak'ké* and Phthisis, although the two diseases are very commonly rife on the same locality.

Œdema of the lungs, a dropsical effusion into the substance and tubes of the organs, is one of the most rapidly fatal complications of the disease. Death from asphyxia usually results in from 10 to 24 hours. Vomiting in these cases is generally present, and the ejecta consist largely of frothy fluid from the air passages. The condition is distinguishable during life by certain physical signs.

Dropsy of the pleural sacs (the pleuræ are to the lungs what the pericardium is to the heart) may also occur, but if limited to one side the effects may be less severe than those of pulmonary œdema.

The term *Shiyôshin* as used by the Japanese has no special pathological signification, but serves merely to indicate a serious disturbance of circulation and respiration, usually associated with vomiting and liable to develope at the commencement or in the course of the disease. The symptoms may originate from four causes, but any two, or all, of these may be combined. Firstly rapid effusion of fluid into the pericardium, leading to primary embarrassment of the heart's action and secondary congestion of the lungs; secondly œdema of the lungs, or suddenly developed dropsy of the pleural sacs, in which cases cardiac disturbance is secondary to interference with the pulmonary functions; and, thirdly, intense over-action of the heart without any signs of dropsical effusion, the organ appearing to exhaust itself by its rapid contractions. These conditions may usually be easily distinguished from one another by careful examination.

e. Affections of the Digestive organs.—In Sub-acute and

Digitized by Google

Chronic *Kak'ké* there is seldom anything for notice in the state of the digestive organs. Loss of appetite and common dyspeptic symptoms are sometimes present, but are of little importance. Occasionally, however, a good deal of gastric irritation may exist, and any vomiting associated with this might be mistaken for the vomiting commonly accompanying the development of '*Shiyôshin.*' The error might not only lead the medical attendant to startle the friends, and perhaps the patient by a fearfully grave prognosis, but would cause him to omit the treatment and precautions necessary to relieve the true condition.

The vomiting of *Kak'ké* is characterized by its comparatively painless accomplishment, by its obstinacy, by the absence of signs of common gastric irritation, and by its almost constant association with shortness of breath, palpitation and other bad symptoms. A difficulty of diagnosis may, however, sometimes arise from the co-existence of dyspepsia. The vomited matters consist of food, mucus and bile, and, when œdema of the lungs is present, a frothy fluid is expelled in large quantities; at a later period the substances are mixed with blood, and under the microscope show the cells (epithelium) which line the mucous membrane of the stomach.

The complication usually subsides spontaneously some hours before death, but the cessation is apparently attributable to complete exhaustion of the muscular walls of the stomach, as, although food and remedies are no longer rejected, the patient rapidly sinks.

Post-mortem evidence shows that the whole length of the intestinal canal may be intensely congested and stripped of its cellular coating, while a blood-stained fluid may be mingled with the ordinary contents, but there is rarely any sign during life. The condition is not inflammatory.

The spleen, which becomes enlarged in most malarious affections, appears to be normal in *Kak'ké.*

The *Urinary organs* show no changes peculiar to the disease. Albumen is not found in the urine except in certain cases of '*Shiyôshin*' and then appears to be secondary to the general disturbance of circulation. Altera-

Digitized by Google

tions in the proportions of the urinary elements occur in connexion with dropsical effusions but are not in any way specific.

f. Affections of the blood and system generally. ***Debility*** is necessarily present in a large number of cases, since the circumstances which appear to lead to the generation of the *Kak'ké* poison, and those which determine the outbreak of the attack, also tend to the impairment of the general health, but there is no essential connexion between *Kak'ké* and bodily feebleness: the worst forms of the disease may appear in patients previously vigorous, while weakly subjects may escape with a very mild attack.

Anæmia, or deficiency in the red corpuscles, the oxygen bearing elements of the blood, is considered an essential element in the production of Beriberi in India, but there is no real connexion between this condition and *Kak'ké.* In the cases occurring in the Japanese navy not more than 8 per cent. show the visible signs of anæmia, and even when present it bears no relation to the severity of the special symptoms.

Fever is absent except in a few instances, where its appearance at the commencement of the disease is probably due to some catarrhal or malarious complication which may have determined the period of the outbreak.

In Sub-acute and Chronic *Kak'ké* the temperature is normal, or may be slightly lowered, owing to a diminution in the natural tissue-change. In Acute *Kak'ké* it begins to fall soon after the appearance of *Shiyôshin,* and the thermometer placed in the armpit may just before death register 8 or 10° Fah. below the healthy level. It is probable, however, that the temperature of internal organs differs widely from this surface estimate

The cooling down of the surface begins in the hands and feet and extends gradually towards the trunk. Increased frequency and diminished force of the pulse at the wrist go on *pari passu* with the loss of heat; the beats become first uncountable and then imperceptible, even while visible and forcible throbbing are apparent in the neck and chest.

Digitized by Google

g. Dropsical effusions are present in most cases of *Kak'ké* and are distinguished from dropsies secondary to organic disease by their peculiar localization, occasionally by the suddenness of their development, and by the difficulty of finding any satisfactory explanation of their appearance. The situations especially liable are the skin and the loose tissue beneath it in certain situations, the substance and air passages of the lungs, and the serous sacs surrounding the heart and lungs : other parts may, however, be involved in rare instances.

An early but generally brief symptom of ordinary *Kak'ké* is a swelling of the legs ; this is most marked over the subcutaneous surface of the shin-bone and is commonly not to be detected elsewhere: the ankle prominences and the feet are seldom affected. The condition often disappears before the patient comes under treatment and is rarely persistent ; its amount is not proportionate to the severity of the attack, and its subsidence is not necessarily associated with an improvement in the other symptoms. Its recurrence is, however, an unfavourable sign.

The face is much less frequently attacked, but when this is the case the other symptoms are likely to be more serious. The features become pallid and puffy and the membrane covering the white part of the eye (the conjunctiva) is watery in aspect and slightly swollen.

The integument of the neck and upper part of the chest is a still more rare seat of the effusion ; it is sometimes affected at the same time as the face. Cardiac and respiratory disturbance are generally troublesome in these cases, but recovery usually takes place.

Dropsy of the lungs and of the pericardium have been already referred to. Dropsy of the pleural sacs, especially the left, is described by Dr. Hoffmann as more frequent than effusion into the pericardium, but I have not yet met with an instance of it. There is little doubt, however, that every part of the body is subject to the condition, but a far more extensive experience than that we at present

Digitized by Google

possess is necessary before the relative frequency of its occurrence in different situations can be demonstrated.

Œdema of the muscles and even of the tendons is mentioned by the same writer as occurring in many cases, but in my experience this is very rare; the signs adduced in support of its frequent existence are capable of another explanation.

Abdominal dropsy is said to be a common complication of Beri-beri, but is exceptional in *Kak'ké*. Increase of the fluid in the cranium and spinal canal is also described.

Period of latency.—It is noticeable that the symptoms rarely become manifest until after a long period of exposure to the influences under which *Kak'ké* arises, and that the length of this period of latency appears to depend chiefly upon individual susceptibility; thus, in a body of men placed under precisely similar conditions of dwelling, food, etc., a certain number may never develope the disease at all, others may be free for several years, while a few may be attacked at the end of six months or even after a shorter term of residence in the infective locality. As a general rule, however, a residence of six or seven months is necessary. The attack may appear for the first time after the person has left the *Kak'ké* district and while he is in a place where *Kak'ké* is unknown. In illustration of these points, an outbreak may be referred to which happened in a Japanese ship, the *Tsukuba Kan*, during a winter voyage to America. In nearly forty out of sixty cases which appeared the patients had not previously had the disease. One man died at San Francisco, and greatly puzzled the surgeons of that town by his symptoms and by the *post mortem* appearances. Several of the others were seized on the return voyage a short time before reaching Japan, nearly six months after leaving the country, and one of these, a native of a place where *Kak'ké* does not exist, had been a Tôkiyô resident for only two months.

Frequency.—It is impossible at present to calculate the

Digitized by Google

proportion of the general population attacked by the disease, but some information may be obtained from the military and naval statistics. For the opportunity of quoting from the former I am indebted to Dr. Beukema of Tôkiyô.

The reports of the Army and Navy Hospitals of Tôkiyô for 1875 show a proportion of 3.8 per cent. of the total forces (17,500) admitted into the wards. Besides these, a very large number of men, raising the percentage to 26, were temporarily invalided as suffering from *Kak'ké* but from various causes (usually slightness of the symptoms) were not sent to the hospital.

In the military stations of Ôsaka, Kumamoto, Hiroshima, Nagoya and Sendai the proportion under hospital treatment was about the same as in Tôkiyô.

The relative frequency of the different forms of the disease varies considerably in different years and under many other circumstances. In the naval hospital in 1875, a fairly average year, the per centage ratio of Sub-acute, Chronic, and Acute *Kak'ké* was respectively 80,11 and 9. The proportion of Acute cases is apparently higher in the military and civil hospitals.

Mortality.—The death rate can only be ascertained in the army and navy. The mean mortality in the various military and marine hospitals for 1875 was 18.5 per cent., with a range in the different stations of 8.6 to 30 per cent. If the trifling cases not sent to the hospitals are taken into consideration, the proportion of deaths would of course be much lowered. The death rate of Beri-beri in India ranges from 14 to 36 per cent.

The Morbid Anatomy and Pathology of *Kak'ké* cannot be discussed without entering into technical details that would be out of place in the present description. It will be sufficient to say that the few examinations made have revealed nothing beyond dropsical effusions, intense venous congestion of internal organs, occasional extravasation of blood, and stripping of the stomachal and sometimes of the intestinal cellular coating. All of these appearances are results of *symptoms* and give no information as to the

Digitized by Google

primary lesion. The symptoms during life indicate the nervous system as the point to which the disease-poison directs its attack. The microscope, however, shows no specific morbid changes in the nerve centres or in any of the internal organs, but in many diseases the most serious functional disturbance may exist without any appreciable alteration of structure.

Ætiology.—The causes of *Kak'ké*, like those of Beriberi, have been the subject of much speculation, but with little definite result. Beri-beri is most commonly believed to depend merely upon a peculiar form of anæmia and debility induced in tropical climates, but this theory will not explain the occurrence of *Kak'ké* in Japan, as the disease is known in Hakodate which is nearly on the same isothermal line as London, and anæmia and debility moreover, though frequent, are not essential concomitants.

Most of the native doctors believe that the complaint is caused by "poisonous and putrid emanations" from the soil, and hence, they say, the appearance of the earliest symptoms in the legs, which are nearer to the source of the evil influence than the rest of the body. Setting aside the supporting argument, the view is not unreasonable, as a striking analogy to ordinary malarious disease is seen in the relation between the prevalence of *Kak'ké* and certain conditions of locality, climate, and season; and in the tendency to prolonged latency and the predisposition to repeated recurrence induced by the first attack, but the symptoms are totally different from those attributed to paludal poisons and are not amenable to the same treatment. The various circumstances which appear to influence directly or indirectly the prevalence of the disease, will now be considered separately, in order that the relative importance of each may be seen.

Locality.—*Kak'ké* is endemic in the three great cities of Japan, Kiyôto, Ôsaka and Tôkiyô and was until recently supposed to be limited to these, but at the present time cases are known to occur in Hakodaté, Nagasaki, Kôbé, Nagoya, Niigata, and Yokohama. It has also appeared amongst the troops stationed at Kumamoto, Hiroshima

Digitized by Google

and Sendai, but it is not known whether the civil population of these places suffer. Further investigation is greatly needed, but there is little doubt that it would be rewarded by the discovery of the disease in many other places.

It appears to be peculiar to low lying towns, mostly on the sea coast, and having a *badly drained* alluvial soil. Where the level and soil of a town are suitable for the development of *Kak'ke*, but the disease has never shown itself—as in the case of Kagoshima—we shall probably always find that some natural advantage of position ensures the free flushing of the drains.

The vicinity of rice fields is usual but not invariable. The coincidence of rice cultivation and *Kak'ké* or Beri-beri probably indicates merely that abundant moisture is necessary for the production both of the grain and of the disease.

In Tôkiyô nearly the whole of the cases originate in the low damp quarters of the city, while the inhabitants of the more elevated parts are seldom attacked. A moderate elevation (40-50 feet), however, if in the immediate neighbourhood of low ground, does not ensure complete immunity. In considering the influence of locality, it must be remembered that the lowest parts of the city are also the most crowded, and are peopled for the most part by the poorer classes: and, in connexion with such places as Hakodate and Yokohama, that the native population is chiefly composed of emigrants from various parts of the country, many of whom may have brought the seeds of disease already laid in their systems from Tôkiyô, Kiyôto or Ôsaka.

Season and Climate.—During the dry healthy months from October to May (inclusive) very few cases of *Kak'ké* appear, but during the prevalence of the South-west monsoon, when high temperature is associated with abundant rain-fall, the disease rate rises. The early cases occur at the beginning of June, or in the latter half of May; in July the number is largely increased; the maximum is reached in August, and a sensible decline is noticed towards the end of September. In the months of December, January, February and March an outbreak is very rare. During the present winter, however, in which the weather has been

Digitized by Google

unusually rainy and almost without frost, several patients have come under treatment in the naval hospital.

Under certain circumstances an epidemic may break out in the winter months and in cold latitudes, but only in persons who have previously resided in a *Kak'ké* district. The journey of the *Tsukuba Kan* previously referred to affords us an example of this.

A reduction of either the heat or the rainfall below the usual average in the summer months is accompanied by a diminution of the numbers attacked.

Hýgiene.—Bad drainage is a conspicuous evil of every town in which *Kak'ké* is prevalent and especially in the low densely populated quarters. Refuse matter is conveyed away by means of open or imperfectly covered gutters, mere ditches without proper walls, which run along the narrow streets immediately in front of the houses. Unless the stream passing along these channels be copious and rapid, blocking must frequently occur: then the sluggish or stagnant contents, foul and putrefying, poison the air by evaporation, and spread by soakage into the adjacent soil, loading it with organic matter, contaminating the surface water and that conveyed in permeable pipes, and converting the wells into receptacles for diluted sewage. The ill-effects of bad drainage cannot be too strongly impressed upon the Japanese authorities, as not only is it intimately connected with the development of *Kak'ké*, but it is also answerable for the generation of typhoid fever, the spread of cholera, and a slow deterioration of the vital power of many thousands of those who are fortunate enough to escape acute disease.

In almost all the towns and villages in the neighbourhood of hills the drainage is effected by means of broad, usually swift streams, which run along the centre of the streets. In these places *Kak'ké* is unknown. Kagoshima has but one advantage over Tôkiyô—good natural drainage, and is free from the disease, while several towns on the same isothermal line, but drained like Tôkiyô, suffer considerably. A portion of Ôsaka is well drained, but the greater part is in the same condition as the capital.

Digitized by Google

The principles of *ventilation* are entirely ignored in a Japanese house. Apertures for entrance of fresh air and for the escape of that deteriorated by respiration, perspiration, charcoal fumes, and kerosene or other lights, are systematically omitted, and hence at night, when the whole building is converted into a kind of closed packing-case by means of wooden shutters, the contained gases and suspended matters supposed to answer the purposes of an atmosphere, can be tolerable only to a people existing by a process of natural selection after some centuries of an asphyxic elimination of the unfitted.

Overcrowding is undoubtedly the most powerful of all the exciting causes. In India and Ceylon Beri-beri makes terrible havoc in the barracks and jails, and in Japan *Kak'ke* appears to reach its highest degree of prevalence and malignancy under similar circumstances. The defective sleeping accommodation on ships appears to be especially active in determining an outbreak of the disease amongst those who have previously lived in a *Kak'ké* district. A striking example of this occurred in the summer of 1875 amongst the crew of a Japanese vessel lying at anchor at Yokosuka. Out of 300 seamen, about 70 (the exact number could not be obtained) were attacked by *Kak'ké*, over 20 died in a very short time, and 47 were afterwards sent for treatment to the Naval Hospital. Fifty other men were at the same time prostrated by various diseases. On enquiry, the food, clothing, and exercise of the sailors were found satisfactory, but nearly the whole crew slept during the night in a space allowing only 32 cubic feet per head, while owing to the anchorage of the ship the air respired was almost stagnant. After a medical investigation the sleeping arrangements were at once entirely altered by the Admiralty, and as a result the epidemic almost immediately ceased.

Race.—The disease has been up to the present time almost limited to the Japanese, only a very few cases, and those of a mild character, having occurred among the foreigners living in the country. The safety of Europeans and Americans is probably owing to their exemption from

Digitized by Google

most of the unhealthy conditions under which the complaint arises in the natives. Almost all the civil residents are in good circumstances, and the English and French troops formerly stationed in Yokohama occupied well constructed barracks situated on high ground. In India and Ceylon the foreign troops have suffered extensively from Beri-beri, in consequence, probably, of defective barrack accommodation, and there is little doubt that outsiders placed under similar unfavourable circumstances in Japan would develope *Kak'ké*. The Chinese settlers, who are crowded together in low districts, are said to be subject to it, but no reliable information on this point can be obtained.

Age.—An attack rarely occurs before the age of 15 and is comparatively uncommon after 40. The period in which the greatest liability exists is between 20 and 30. The same comparative immunity during the extremes of life is present in common malarious Fevers.

Sex.—Women are less subject to the disease than men; the proportion is said to be about 1 to 3, but this calculation is not founded upon statistical information. It appears to arise most commonly during the confinement to the house following childbirth.

The greater frequency in men probably depends chiefly upon over crowding in barracks, and ships in the case of soldiers and sailors, and upon the lazy sedentary life led by a large portion of the males of the civil community, the wives of whom are saved from the dangers of inaction by the necessity of carrying on the household duties and ministering to the wants of their husbands and families.

Rank and Occupation.—The higher classes of the Japanese seldom suffer from *Kak'ké*, probably because, in addition to the ordinary advantages of superior circumstances, they possess residences in the higher and more healthy parts of the town. Some notable exceptions to the rule, however, exist, as in the case of the Shôgun Iyemochi, who is said to have died from the disease in Ôsaka twelve years ago. In many such instances, erroneous diagnosis

Digitized by Google

may have occurred, as the imperfect education of nearly all the older Japanese physicians rendered them liable to confound *Kak'ké* with other ailments in which dropsy or cardiac disturbance played a part.

The lowest classes, the coolies, are also remarkably free from the complaint; but these people, owing to their laborious occupations in the open air, are the best developed and most vigorous men in the country, and boast an unusual exemption from disease in general.

The subjects especially selected are soldiers, sailors, shopkeepers and their assistants, students, and the poorer classes of literary men. Sedentary occupations seem to be chiefly injurious in involving confinement to unhealthy houses.

Food, As Beri-beri exists only in countries where rice is largely grown, the disease is sometimes attributed to the non-nitrogenous diet of the people. The same view is held by some with regard to *Kak'ké*, but is without foundation, since the coolie class, who live more exclusively upon rice than the soldiers, sailors, or trading classes, suffer far less than these. The Chinese, moreover, who are rice eaters know neither Beri-beri nor *Kak'ké* in their own country; while the occurrence of Beri-beri amongst foreign troops in India shows that nitrogenous food affords no protection from that complaint.

Insufficiency or low nutritive value of food may act indirectly by lessening the power of resistance to morbid influences, and the injurious habit, almost universal in the rice-eating parts of Japan, of swallowing the grains without mastication, is a powerful cause of dyspepsia and all its resulting evils. The possibility of conveying disease by impure drinking water must not be forgotten, and the interesting facts recently brought forward by Professor Atkinson, shew that a large portion of the Tôkiô supply is wholly unfit for internal use. The prevalence of *Kak'ké*, however, in different districts bears so little relation to the source and quality of the local water, that no important connection between the two circumstances can be assumed.

Digitized by Google

Besides the circumstances already named as associated with the development of *Kak'ké*, any condition capable of inducing temporary constitutional disturbance may at times determine a manifestion of the effects of the previously latent poison. The most frequent of these is perhaps exposure to cold and wet: many of the patients give an account of having "caught cold" as the starting point of their symptoms, and the same cause probably gives rise to the brief elevation of temperature occasionally seen at the commencement of the disease.

A change of place, even though it be from low to high ground, or from an unhealthy to a healthy situation has been known to be followed by an attack, the sudden alteration of atmosphere, temperature, and perhaps of habits, producing a slight shock to the system and the consequent explosion of the hitherto inert mischief. A change of place from an healthy to an unhealthy district is of course still more liable to induce the disease, hence the natives of Kagoshima and other places where *Ka'kké* is unknown are especially predisposed to it after a term of residence in Tôkiyô, Kiyôto, or Ôsaka. The same phenomenon has been observed in ordinary malarious affections.

Debility from past illness sometimes appears to arouse the symptoms, but a complication here exists in the confinement to the house necessitated by the previous complaint. In the naval hospital at Takanawa, which is well situated and well constructed, the convalescence of acute disease is very rarely interrupted by *Kak'ké*. 'Puerperal' *Kak'ké* is probably rather a result of impure air during confinement in doors, than to the debility left by the physiological process which has been accomplished.

The resumption of laborious work too soon after recovery from the attack of *Kak'ke* sometimes leads to an immediate and troublesome relapse.

In summing up the evidence given by the foregoing facts, we may fairly conclude that an atmospheric poison of local origin is the '*materies morbi*'; the mode of generation of this is not yet fully demonstrated, but we have

Digitized by Google

seen that the elements always associated with the prevalence of the disease are a low damp locality with an alluvial soil, a high temperature, heavy rainfall, and bad drainage, and, so far as our experience goes, the disease-rate diminishes in proportion to improvement in either of these factors, and is absent altogether where the last —fortunately a removable one—is non-existent. The influences of age, sex, rank, occupation, food, etc. are merely secondary, but the habitual inhalation of impure air—as in the case of overcrowding in ill ventilated barracks and dwelling houses—is the great determining agent in arousing germs which might otherwise lie in the system inactive and harmless for an indefinite period.

Treatment.—It will be sufficient here to indicate to what extent and in what manner the disease may be influenced by therapeutical agency, without entering into technical details. The treatment is at present in a transitional state, and though it may be considered to have made visible progress in the last few years much still remains to be attained by close observation and cautious experiment.

No specific remedy for *Kak'ké* is yet known. Quinine, arsenic and all the anti-malarious armament are powerless. Arsenic has been recently recommended strongly for Beri-beri by Dr. da Silva Lima of South Brazil, but statistics which show a mortality of 25 per cent. do not encourage any great confidence in the curative effects of the medicines exhibited.

Removal of the patient to a healthy situation is recognized by all authorities, Japanese and foreign, as an essential element of treatment in all forms of *Kak'ké* which develope in a *Kak'ké* district. In other respects our measures are purely symptomatic.

In *Sub-acute Kak'ké* change of place is sufficient to effect a complete cure, but the duration of the symptoms may be shortened sensibly by accessory remedies, of which the chief are Faradaic electricity and spinal stimulants.

In the *Chronic* form the two last mentioned agents are decidedly injurious as long as the muscular hyperæsthesia

Digitized by Google

persists. The writer three years ago was led to adopt, on theoretical grounds, the use of Aconite for the purpose of relieving the exaggerated sensibility of the muscular system, and is now able to recommend this, if carefully and perseveringly administered, as a remedy for the most advanced stages of the Chronic complaint.

In the *Acute* form little can be done when the symptoms of *Shiyôshin* are fully developed, as the system refuses to answer the appeal of the most energetic materials which our pharmacopœia can furnish, and even the direct mechanical removal of dropsical effusions has failed to alter the fatal course of the disease. If, however, the early signs be detected and steps be promptly taken to procure by the ordinary means reabsorption of the dropsical exudations, which are in the large majority of instances the source of danger, an immediate improvement may be usually counted upon, and if relapses be watched for and treated in like manner, death may be averted in more than one half of the cases hitherto considered incurable.

In conclusion, I venture to express a confident opinion that *Kak'ke* is a disease which exists only on sufferance, and will receive its warrant of annihilation when the Japanese authorities devote as much energy and judgment to the destruction of foes which have for centuries lurked in their houses and gutters, as they have lately manifested in staying the ravages of a rare though terrible invader from a far country.

Digitized by Google

ASIATIC SOCIETY OF JAPAN.

A General Meeting of the Society was held at the Grand Hotel, Yokohama, on Saturday, 12th January. By request of the President, Dr. Hepburn occupied the Chair.

The minutes of the previous meeting having been taken as read, the Recording Secretary stated that acting under instructions from the President he had issued invitations to all members of the medical profession in Yokohama to be present at the meeting.

Dr. Anderson then read a paper on *Kak'ké*.

The Chairman observed that the Society was greatly indebted to Dr. Anderson for his valuable contribution to medical science. He was glad to see so large a gathering of members of the profession, most of whom must have had opportunities of observing the disease. He had himself seen cases ever since his arrival in this country, but his dispensary practice was not favourable for its study. He had been greatly interested by the graphic description of the symptoms given by Dr. Anderson, which perfectly agreed with what had come under his own observation. He hoped that the gentlemen present, whether visitors or members of the Society, would give the meeting the benefit of their experience, and he named Dr. Simmons as having devoted special attention to the subject.

In response to the Chairman, Dr. Simmons stated that he had frequent opportunities of observing cases of *Kak'ké* in the last seven years; but that in his first visit to this country (1859-1864) he had not seen a single case. It had been since explained to him that the Japanese at that time considered it to be a disease of which foreign doctors could know nothing, and that therefore they did not consult them. Until recently it had been supposed that the disease was peculiar to the East Indies and Japan, but it is now mentioned that it exists in South America. There could be no difference of opinion as to the correctness of Dr. Anderson's views about the conditions in which the disease originates: in Yokohama since the filling up of the swamp there had been a very marked increase of *Kak'ké*. The disease was distinctly of a local character, and immediate change of air, even to so short a distance as Kanagawa, was an efficient remedy in the early stages. He was himself so convinced of the uselessness of attempting to treat the disease in the place where it had been contracted, that he never allowed a case to be admitted to his hospital. He wished that Dr. Anderson had given details of treatment, and thought

Digitized by Google

that hardly sufficient stress was laid in the paper on the action of the disease on the muscular system, which in his opinion was the immediate cause of fatal result. He had found that the disease was chiefly among persons in comfortable circumstances, while the coolie class appeared to enjoy an almost complete immunity. He thought that a very small proportion of cases proved fatal, the great danger being drowning by dropsical effusion.

Dr. Eldridge said that his experience of the disease under consideration, which was confined to the locality of Hakodate, differed in some unimportant particulars from that of both the preceding speakers; from that of Dr. Anderson in that the proportion of females attacked was much larger than one-third, perhaps even greater than that of males, and in that the disease seemed almost peculiar to the lower classes such as coolies and junk sailors and their families; and from that of Dr. Simmons in that the mortality was exceedingly great. It was, however, very difficult for a foreign physician practising in Japan to form any correct estimate of the mortality of the diseases which he meets with among the natives, for, as all his colleagues knew, they are seldom called in until the patient is already *in articulo mortis*; a fact, that in a disease like *Kak'ké* in which the cases vary so widely in duration, severity and symptoms, would, if not duly considered, cause the mortality to be much over-estimated. He had been so fortunate as to secure one post-mortem examination, which by the courtesy of the local authorities he had been able to execute with tolerable completeness. The appearances alluded to by Dr. Anderson, such as dropsy of the various cavities, general anasarca, degeneration of various important viscera and of the muscular system, were found present, and he agreed with him in considering them as merely symptomatic. He found also a marked change in the spinal cord, this, in the lumbar region only, being surrounded by dropsical effusion, enlarged and, although the examination was made soon after death, softened to a degree that rendered its removal from the canal a matter of some difficulty. Microscopical examination, after hardening in chromic acid, showed much injection of the capillaries and some points of extravasation, while the nerve cells proper were embedded in a mass of granular debris mingled with large oval cells of two or more nuclei, some of these cells exhibiting slight processes as though there had been an abortive attempt at polarity. As he believed that in the few autopsies of *Kak'ké*, in which the spinal cord has been examined, among which he might mention those made by Dr. Berry of Kôbe, as well as in those of the identical or closely related disease Beriberi, corresponding conditions have been found. He was inclined to go still farther back than the muscular system for the proximate cause of the various phenomena of the disease, and to believe that the first action of the morbid poison is upon the nervous system, all the succeeding changes being but manifestations of the perverted or deficient action of this controlling factor. He agreed with the preceding speakers in believing that the prime cause of *Kak'ké* is a specific poison, either atmospheric,

Digitized by Google

of soil origin and allied to malaria, or of a nature analogous to the poisons of typhoid or typhus.

Mr. Dickins hoped that Dr. Anderson would explain the treatment that he had found most efficacious, and described a case that had for a time come under his own observation, in which the most noticeable manifestation was a peculiar cramp of the muscles of the hands.

Reviewing what had been said, Dr. Anderson stated that he did not differ from Dr. Simmons as to the importance of the action of *Kak'ké* on the muscular system, as would have been seen had he read the whole of his paper, but at the same time he agreed with Dr. Eldridge that the disease first assailed the nervous system. The remedies that were most efficacious were those that attacked the nervous system. (The speaker then read an extract from his paper on this point.) He believed that the cases in Brazil more closely resembled the Indian disease Beri-beri than *Kak'ké*.

Mr. Dickins then proposed a vote of thanks to Dr. Anderson, as well as to those gentlemen who by their speeches had added to the interest of the meeting. This was carried by acclamation, and the meeting then separated.

Digitized by Google

Digitized by Google

REMARKS ON THE DOJÔ.

BY

DR. H. FAULDS.

Read before the Asiatic Society of Japan, on the 26th January, 1878.

This word is translated by Dr. Hepburn in his valuable dictionary, 'Lamprey,' with a mark of interrogation; but in the excellent English-Japanese Dictionary of Messrs. Satow and Ishibashi, *Dojô* without the query is given as the equivalent for Lamprey. From a careful dissection of the dead, and study of the living animal, I am prepared to say that those sold to me under the name *Dojô* belong to the very different genus Cobitis or Loach, of the family Cyprinidæ, and are identical, I think, with the C. barbatula which I have often seen in Scottish burns. The head of the *dojô* is small, the mouth is surrounded by six or eight barbules as is the case with several species of fish which inhabit muddy streams. These have been supposed to be organs of touch, and I noticed that in the living animal they were often erect and mobile like the antennæ of insects. A microscopic examination showed them to be rich in muscular fibres for movement, and through the centre run a thick bundle of very delicate nerve fibres which spread out on the surface of each barbule's tip. These, I suppose from the manner which the *dojô* dips its head down, assist in the search for food, and hence they are found situated in the most convenient place,

Digitized by Google

i.e., around the mouth. These fish have a small gill opening, and as in those found in Scotland they have three branchiostegous rays. They are covered with small scales, have a yellowish white belly, long shaped body darkly mottled, and they show enormous vitality. They exude a mucous secretion, which I conjecture may preserve them in life during drought.

Beggars, to evade the law, may be seen at the bridges of many canals in Tôkiô with little tubs full of the slimy *dojô* for sale.

Pious Buddhists who wish to purchase merit by setting free these living creatures in the rivers or canals, may do so cheaply, and help the poor at the same time. I lately saw a poor looking, distressed woman purchase one, and throwing it over to its native element, she watched its eager escape with a look of joy, while rubbing her hands solemnly she muttered a prayer. This act of meritorious liberation is called *Hô-jô-ye*.

I beg to hand round microscopic drawings from life of the Argulus foliaceus (fish-louse) which was brought to me for examination by Doctor Sanno of Shiba. It is found parasitic on the gold-fish here, and is exactly of the same species with that which preys on the Cyprinidæ (carps, etc., the same class to which the *Dojô* belongs) in German and English fresh water lakes. I have compared my own drawings from the living animal with those of Professor Claus of Vienna, who has written a long article on the Argulus in the *Zeitschrift für Wissenschaftlichen Zoologie* (20ten Mai, 1875).

There can be no doubt whatever that the animals from which both sets of drawings were made are of identical species.

This fish-louse, however the name may repel, is one of the most attractive and interesting objects in the microscope I have ever seen, and it may be kept alive for a long time. You can study muscular tissue in action, the circulation of blood and movements of various organs as one might study the works of a watch made entirely of glass. The action of muscular fibres is better understood

Digitized by Google

by a simple glance at this pretty little parasite under a powerful microscope than by endless vivisections.

My first impressions are, that some of the theories as to muscular action would receive their deathblow from an exhaustive study of muscular action under such favourable circumstances as in a transparent living and healthy organism like this.

The discovery of fresh water fishes and their parasites in the lakes and rivers of Japan, identical with those of England and Germany, is a fact of some interest in relation to theories a good deal discussed at the present day. What has well and wittily been called the *Cosmopolitanism* of fresh water fishes is a fact not easily reconcileable with one of the most popular of these theories, and that fact is yearly having a broader significance.

Digitized by Google

Digitized by Google

ASIATIC SOCIETY OF JAPAN.

A General Meeting of the Asiatic Society was held at the Tôkiyô Shoseki-kuwan, on Saturday, 26th January, Sir Harry S. Parkes, President, in the chair.

The minutes of the previous Tôkiyô meeting having been read and approved, the President congratulated the Society upon their being able to meet in such a splendid room, which they owed entirely to the kindness of the Minister of Education and to the energy of their Vice-President.

The election of Mr. W. H. Stone, and of Dr. W. B. Simmons as members of the Society was then announced.

The President said that the Council had decided to recommend to the Society the appointment of a Committee of ordinary members for the purpose of assisting them in revising the existing rules. These rules had done good service, but some modifications had already been made, and as it was desired to print them in a separate form, that each member on election might receive a copy, a thorough revision was first necessary, and he therefore proposed that Messrs. Grigsby, Chaplin, and Wilkinson, be appointed a committee to confer with the Council on this subject. This was put to the meeting and carried unanimously.

The recording Secretary then announced that the Council, with the assent of the Committee appointed at the last General Meeting, had decided to propose to the Society the alteration of rule 5, to the effect that at whatever period of the year a member might be elected, his subscription should be due upon election. As the rule stood at present, a member elected in July would receive the Transactions for that year, whilst his subscription would not become due until the January following. The Council, therefore, proposed the alteration of this rule. This was put to the meeting and carried *nem. con.*

The Library Committee announced the receipt of various books and periodicals.

Dr. Syle mentioned that he had intended to bring forward a series of resolutions respecting the transliteration of Japanese words into Roman characters, but was precluded from doing so at this meeting, by the existence of a rule which required that one week's notice should be given. He, however, would read them, and allow them to remain on the table until the next meeting.

Dr. Faulds communicated some interesting investigations he had made upon the Dojô, called Lamprey, in Hepburn's

Digitized by Google

dictionary, and upon the Argulus foliaceus, found parasitic upon gold fish.

Mr. Ayrton then gave a verbal account of his researches upon the conduction of heat in stone, and, at its close, called the attention of the members present to a radiometer, an instrument which had been for some time past exciting great interest in scientific circles abroad.

Mr. Grigsby then proposed the following motion: "That this meeting, while thanking Messrs. Ayrton and Perry for their paper, deems it, from the nature of the subject, unsuitable for insertion in the Transactions of the Society." He said that from the extracts which had been given from the paper, it did not appear to be such as the constitution of the Society provided for. The first and second rules distinctly said that the subjects printed by the Society must have some immediate connection with Asiatic countries, and he had failed to find that in this paper. He did not wish to be understood as expressing any opinion upon the merits of this paper—his objection was wider, being against the publication of any abstract scientific or other papers, which did not bear directly upon the country in which we were living. His motion did not refer to the delivery of lectures upon any subject, as that was provided for in the rules, but he directed attention to rule 12 (d), which defined as one of the duties of the Council, the *selection* of papers for publication in the Society's journal. Doubtless the authors of the paper which had been read, were doing good work, but he considered that it was not of a nature suitable for publication by the Society.

Mr. Parson seconded the motion, and referred to a former project of founding a physical sub-section, before which such papers might have been read, but it had been felt unadvisable to inaugurate such a section. They had listened with great interest to the account which had been given of the experiments, but at the same time he did not think that such a subject properly came within the objects of the Society.

Mr. Ayrton said that to say that the publication of scientific papers did not fall within the scope of the Society was to take a very illiberal view of its objects. Other Asiatic Societies, that of Bengal, for instance, not only sought such papers, but had a special sub-committee for the purpose of deciding upon them. It had been urged that the subject of the paper was not connected with Japan; but he failed to see how that could be said of experiments on Japanese stone in which Japanese students assisted.

Dr. Faulds thought that Mr. Grigsby's remarks would approve themselves to all the members. He thought that the financial condition of the Society would not permit the publication of any papers not bearing upon the subjects, for the study of which the Society was founded.

Mr. Dallas said that reference had been made to scientific papers being read at a meeting of a physical sub-section of the Asiatic Society. He pointed out that one motive for not printing such papers was the expense incurred, which could

Digitized by Google

be ill-borne by the Society in its present condition. Scientific papers are usually accompanied by diagrams and long tables of figures, which occupy much space and require special skill in setting up, and these would remain exactly the same whether the paper was read at an ordinary, or at an extra-ordinary meeting of the Society. The rules made a wide distinction between reading and printing. The lecture to which they had listened this evening had been made most interesting, but he would certainly vote against the paper being printed for the reasons he had given. With regard to Mr. Ayrton's suggestion that it fell within the rules of the Society because the stone used in the experiments was Japanese stone, he pointed out that it was not selected because it was Japanese, but simply because it was most readily obtainable: in point of fact the paper, as described by its author, did not treat of the properties of Japanese stone, or indeed of stone generally, but of a new method of testing them. He felt sure that the paper would be welcomed by journals at home, which were devoted to the discussion of such subjects.

Dr. Veeder hesitated to vote for the motion. He felt considerable difficulty in forming an opinion, as he could see clearly that much could be said on both sides. On the one hand there was the question of expense, and yet, as this was the only English-speaking learned Society in Japan, it was desirable that they should print investigations carried out in this country, that their Transactions might be acceptable to other Societies at home. He felt considerable sympathy with the authors, who had communicated their paper under the impression that it would be printed, and he knew the immense amount of labour the working out of the subject must have cost them.

Mr. Atkinson objected to the discussion of the merits of the paper which had been read, as the question was a purely technical one. Were abstract scientific papers to be printed by the Society, or not? Judging from the wording of the rules, it certainly appeared that that did not fall within the intentions of the founders of the Society.

Dr. Divers thought that this meeting had full powers to recommend to the Council the printing, or not, of the paper. He thought it a serious matter that a paper should be brought forward under the impression that it would be printed, and afterwards to be declined.

Mr. Grigsby, in replying, said that the value of the paper was not at issue, the question was merely whether abstract science should be admitted or not.

The President in putting the motion, said that whatever the result might be it was not intended to say or do anything disparaging to the authors of the paper. He had felt considerable interest in the subject, and he felt sorry that they had not had a more scientific audience, one better fitted to appreciate its great merits. The point which was raised by Mr. Grigsby's motion was a purely technical one, and he would merely suggest for consideration whether such papers would

Digitized by Google

not give prestige to the Society. If Societies abroad knew that such papers were published in their Transactions, they would be more warmly welcomed, and this was important, as they depend upon exchange for the means of obtaining those of scientific bodies in Europe and America. The motion was nothing more than a recommendation to the Council, intended to enable them to judge of the feeling of the Society and to aid in their selection of papers. The responsibility rested with the Council, and they were glad to get such help as this afforded them.

The motion was then put, and carried by 11 votes against 9.

Mr. Chaplin moved "that this meeting extend their thanks to Messrs. Perry and Ayrton for the interesting paper to which they had just listened." This was seconded by Mr. Dixon, and carried unanimously. The meeting then adjourned.

Digitized by Google

Digitized by Google

Digitized by Google

1960
ov.8 78

TRANSACTIONS

OF

THE ASIATIC SOCIETY OF JAPAN.

VOL. VI.-PART II.

From 9th February, 1878,

TO

27*th April*, 1878.

YOKOHAMA, LANE, CRAWFORD & Co.
SHANGHAI, KELLY & Co.
LONDON, TRÜBNER & Co.
NEW YORK, APPLETON & Co.

1878.

Digitized by Google

Digitized by Google

TRANSACTIONS

OF

THE ASIATIC SOCIETY OF JAPAN.

VOL. VI.—PART II.

From 9th February, 1878,

TO

27*th April*, 1878.

YOKOHAMA, LANE, CRAWFORD & Co.
SHANGHAI, KELLY & Co.
LONDON, TRÜBNER & Co.
NEW YORK, APPLETON & Co.

1878.

Digitized by Google

PRINTED AT THE "JAPAN MAIL" OFFICE,

YOKOHAMA.

Digitized by Google

CONTENTS.

	PAGE.
The Korean Potters in Satsuma, by E. Satow, Esq., H. B. M.'s Legation.....	193 TO 203
Biological Notes, by H. Faulds, L. F. P. & S.	205 „ 222
The use of the Fire-drill in Japan, by E. Satow, Esq., H. B. M.'s Legation.....	223 „ 225
Hideyoshi's Invasion of Korea, by W. G. Aston, Esq., H. B. M.'s Legation.....	227 „ 248
Destructive Earthquakes in Japan, by I. Hattori, Esq.	249 „ 275
Notes on the Manufacture of Oshiroi (White-lead), by R. W. Atkinson, B. Sc.	277 „ 290
Some Remarks on Constructions in Brick and Wood, and their Relative Suitability for Japan, by George Cawley, Esq.	291 „ 320
Notes on some of the Volcanic Mountains in Japan, by D. H. Marshall, Esq., M. A.	321 „ 345
Notes on the Amount of Sulphuretted Hydrogen in the hot springs of Kusatsu, by Edward Divers, M.D., F.C.S.	346 „ 347
Analysis of the Sweet Potato, by B. W. Dwars, Esq.....	349 „ 352
An Examination of the Earthquakes recorded at the Meteorological Observatory, Tôkiyô, by W. S. Chaplin, Esq.....	352 „ 355

Digitized by Google

Digitized by Google

ASIATIC SOCIETY OF JAPAN.

REPORT OF THE PRESIDENT AND COUNCIL OF THE ASIATIC SOCIETY LAID BEFORE THE MEMBERS AT THE ANNUAL MEETING HELD IN TÔKIYÔ, 22ND JUNE, 1878.

The President and Council have great pleasure in congratulating the Members of the Society on the progress which has been achieved during the past year. The number of General Meetings held in Tôkiyô and at Yokohama has been greater than in any preceding year since the foundation of the Society, a fact which shows that the active interest taken in the objects for which it exists continues to increase. By inviting members to contribute notes of information collected by them or of single observations which they have made, a means has been found of gathering up valuable additions to our knowledge which might otherwise have been neglected.

The President and Council hope that the results thus obtained during the session which is now at an end, will encourage Members to devote themselves with fresh energy to the various branches of investigation which have hitherto been but little explored. We want before all things to learn more about the religions of Japan. Concerning Buddhism in this country we have been up

Digitized by Google

to the present entirely in the dark, and our knowledge of Shintô is still extremely meagre. When we consider that a thorough acquaintance with the Chinese written language is absolutely indispensable, and some knowledge of Sanscrit and Pali of great value to the student of Buddhism, it is not perhaps to be wondered at that no scholar has yet found time to throw some light upon its Japanese developments. For Shintô, however, mastery of the earliest poetical and prose remains is the only necessary preliminary, and the task of explaining its character should be proportionally easier. The introduction of Chinese learning and its influence upon the language and ideas of the Japanese people is a subject which has never been treated, although of extreme importance if we wish really to comprehend the character of the nation and its institutions. It cannot be said either that we possess in any European language a useful account of the history of Japan previous to the middle of the present century, and the nature of the laws, civil, penal, and ceremonial by which the people have been governed in successive ages has still to be ascertained from the original writings and traditions. A few specimens of the pure literature have fortunately been made known already, but there still remain treasures of thought and artistic expression hidden away in the poems and romances of the classical period; while of the dramatic literature in all its various forms, only a small part has been made accessible to Europeans unacquainted with the Japanese language. It would, in the opinion of the President and Council be advisable to make provision for printing in the Transactions of the Society translations of purely literary works, and of the ancient religious and mythological books. In the department of Natural Science a great deal has already been achieved, especially in Botany and Zoology, yet those branches are far from being fully exhausted. Japanese meteorology is still in its

Digitized by Google

infancy, and concerning the physical geography and geology of the country scarcely any information has hitherto been accessible in print. The manufactures for which the Japanese people are distinguished, such as lacquer, pottery of all kinds, cutlery and metal-work, woven fabrics, and others industries, which are perhaps peculiar to the country deserve especially to be observed and described, and even more than these, the fine arts, music, painting, sculpture and architecture, together with decorative art in all its applications merit to be carefully studied in themselves, and to be compared with the corresponding products of the æsthetic faculty in China and India, the countries which have hitherto most influenced Japan in these matters. In philology it is of the utmost importance to form vocabularies of all the words and forms of expression peculiar to local Japanese dialects, among which may probably be included the various dialects spoken in the islands of the Loochoo group, and next, to profit by every opportunity to acquire information about the languages spoken in Yezo, in the Kurile Islands, by the tribes of Saghalin, and in the Korean peninsular. Ethnology too will profit greatly by observations made of peculiar customs whether in the more civilized centres or in remote mountain districts or outlying islands. There is none amongst us who does not possess an aptitude and facilities of some sort for pursuing one or more of the paths of study above indicated, or for conducting inquiries into some of the many other classes of phenomena which are constantly presenting themselves to our attention.

The Council have thought it desirable to add to the list of Honorary Members the names of Mr. A. W. Franks of the British Museum and Dr. J. J. Rein of the University of Marburg.

Twenty-seven ordinary members have been elected during the session.

Digitized by Google

Seventeen General Meetings have been held in Tôkiyô and at Yokohama, and a list of the papers and notes read is attached to this Report. (Appendix A.)

During the session the old Rules of the Society have been carefully considered and revised.

In exchange for the Transaction of the Society, Journals, Transactions, etc., have been received from various learned bodies in all parts of the world. A detailed list will be found below. (Appendix B.)

A catalogue of the books in the Society's Library has been drawn up by Mr. W. G. Dixon, and will be found at the end of the volume of the Transactions for the present year.

Most of the articles which had been collected as the nucleus of a Museum have been by consent of the donors distributed as follows:—

Model of the Sado Mines, to the Museum of the Daigaku.
Case of Butterflies, to the Educational Museum.
War spears and Aino implements to the Tôkiyô Museum.

In consequence of the removal of the Library, some of the furniture which was no longer required has been sold for the sum of eighteen dollars.

Duplicate copies and books unsuited to the purposes of the Society have been sold for the sum of five dollars.

The following works have been added to the Library during the past year :—

The Caucasus and Persia, presented by the author, Mr. A. H. Mounsey.

Geological Surveys of Yezo (3 parts) and
Trigonometrical Surveys of Yezo (3 parts), presented by the Colonisation Office.

Daily Bulletin of Signal Service from June to Oct., 1875, 5 vols. Presented by the Department at Washington, U.S.A.

Comparative Tables of the Japanese and Gregorian Calendars. (2 parts.) Presented by Mr. W. Bramsen.

Digitized by Google

Notice of Fossil Plants from the Jura Formation of Japan. Presented by Dr. J. J. Rein.

The currents in the Northern Part of the Pacific Ocean and their influence upon the climate and vegetation of the neighbouring coasts, by Dr. J. J. Rein. Presented.

Meteorological observations from the Bluff, Yokohama, by Mr. W. H. Talbot. Presented

Waifs and Strays of the East, by Balfour (1 vol. Purchased).

Bhagavad-Gita, a Sacred Lay (Purchased).

Sanscrit English Dictionary, by Monier Williams (Purchased).

Corean Primer by Revd. John Ross. (Purchased).

Brunton's Map of Japan (Purchased).

Will. Adams' Letters. Reprinted at Yokohama (Purchased).

The Council beg to tender their thanks to the Director of the Daigaku for the use of a room for the meetings of the Society during the earlier part of the Session, and to the Department of Public Instruction for the use of a large hall at the Shôhei-kuwan since the beginning of this year. The proprietors of the Grand Hotel at Yokohama are also entitled to the thanks of the Society for the use of a room for general meetings during the whole of the session.

With regard to the finances of the Society, it is satisfactory to find that there is a balance in the Treasurer's hands of $707.20; and as under the new arrangements, the expense of printing Vol. VI, even if three parts be published, will certainly not exceed the amount paid last year for printing the two parts of Vol. V, it may safely be affirmed that the accumulated funds of the Society are more than twice as much as they were at the same period last year. The statement of Accounts for the year now ended is annexed:—

Digitized by Google

The Treasurer in Account with the Asiatic Society of Japan.

Dr.

To Balance received from Mr. Walter	$342.33
„ 55 subscriptions for 1877 and for preceding years collected since July 1877.....	271.82
„ 141 payments for subscriptions for 1878 and for entrance fees as per receipt book	700.28
„ Sale of Proceedings up to the commencement of 1878	120.25
„ Sale of proceedings from the commencement of 1878 to June 15th.....	33.50
„ Sale of furniture.....	18.00
„ „ „ books.....	5.00
	$1,491.18

Cr.

By payment for printing Transactions Vol. V, Parts 1 and 2.....	$416.77
„ Advertising, printing postal cards, receipt books, notices, etc.....	132.42
„ Payment for lithographs	54.08
„ „ „ photographs for Vol. V. Part 2	50.00
„ „ „ Mr. Brunton's Map, subscription to the *Celestial Empire*, purchase of Hong List and books.....	44.50
„ Purchase of stationery, stamps, payment of clerical expenses for a portion of Session 1876-77 and for 1877-78.....	11.63
„ Insurance of Society's property	15.00
„ Postage, freight, shipping, insurance of the copies of Vol. V. Parts 1 and 2 to the foreign Agents in England, America and China to the foreign Societies and the Honorary and non-resident Members	51.48
„ Carriage of apparatus to Seido and the petty expenses of the year, collection of Subscriptions	7.65
„ Balance due to the Society.....	707.70
	$1,491.18

Digitized by Google

Assets.

13 subscriptions due	$ 65.00
Copies of Proceedings in the hands of our foreign Agents, about 250	250.00
Copies of Proceedings in the Society's Library	

Liabilities.

Printing Part 1 of Vol. VI of the Transactions just completed	$145.50
Printing notices and charges for advertising...	74.95

Signed W. E. AYRTON,
Treasurer.

June 15th, 1878.

We have compared the above accounts with the Vouchers and the Receipt Book, and find them to be correct, leaving a balance in the hands of the Treasurer of seven hundred and seven dollars and seventy cents.

ERNEST SATOW,
WILLIAM GRAY DIXON, } *Auditors.*

Digitized by Google

APPENDIX *A*.

The session was opened by a lecture delivered by Mr. E. S. Morse on "Traces of Early Man in Japan."

The following papers and notes have been read :—

A Review of the Introduction of Christianity into China and Japan, by Mr. J. H. Gubbins.

On the Introduction of Tobacco into Japan, by Mr. E. Satow.

On the Water supply of Tôkiyô, by Mr. R. W. Atkinson.

The Maiden of Unahi, by Mr. B. H. Chamberlain.

On the Castle of Yedo, by Mr. T. R. H. McClatchie.

On *Kakké*, by Mr. Wm. Anderson.

Remarks on the Dojô, by Mr. H. Faulds.

On the Conductivity of Heat in Stone, by Messrs. W. E. Ayrton and J. Perry.

Biological Notes, by Mr. H. Faulds.

On the diseases affecting foreigners in Yokohama, by Dr. Stuart Eldridge.

On the Korean Potters in Satsuma, by Mr. E. Satow.

On the Use of the Fire-drill in Japan, by Mr. E. Satow.

On Hideyoshi's invasion of Korea, by Mr. W. G. Aston.

On the Manufacture of O-shiroi, by Mr. R. W. Atkinson.

On the Great Earthquakes of Japan, by Mr. J. Hattori.

Digitized by Google

On Constructions in Brick and Wood in Japan, by Mr. G. Cawley.

On the Volcanic Districts of Japan, by Mr. D. H. Marshall.

On Earthquakes in Japan, by Mr. W. S. Chaplin.

On the Colloquial Dialect of the Middle Ages by Mr. B. H. Chamberlain.

Notes of Scenes between the Old and New Capitals by Mr. W. G. Dixon.

Notes of a visit to Hachijô, by Messrs. F. V. Dickins and E. Satow.

On the Climate of Japan, by Dr. J. J. Rein, translated from the German by Mr. E. Satow.

Digitized by Google

APPENDIX *B.*

The Royal Asiatic Society—Proceedings.
The Royal Geographical Society—Proceedings.
The Royal Society—Proceedings.
La Société de la Géographie—Bulletin.
Le Congrés d'Orientalistes—Notices.
Monatsschrift für den Orient—Urèn.
Mittheilungen des Deutschen Gesellschäft,—Yokohama.
Guido Cora's Cosmos.
La Sociedad Geografica de Madrid—Boletin.
The Royal Asiatic Society, Bombay Branch—Proceedings.
The Royal Asiatic Society, Ceylon Branch—Proceedings.
The Asiatic Society of Bengal—Proceedings and Journal.
The Royal Asiatic Society, North China Branch—Proceedings.
The American Geographical Society—Proceedings.
The American Oriental Society—Proceedings.
The Boston Society of Natural History—Proceedings.
The Royal Society of Tasmania—Transactions.
The China Review.
The Agricultural and Horticultural Society of India—Journal.

Digitized by Google

ASIATIC SOCIETY OF JAPAN.

A General Meeting of the Society was held at the Grand Hotel, Yokohama, on Saturday, 9th February. In the absence of the President and Vice-Presidents, Dr. Hepburn occupied the Chair.

The minutes of the previous meeting having been taken as read, the Recording Secretary announced that at the Council meeting held on the 2nd instant, Dr. H. Latham had been elected a member of the Society.

Dr. Eldridge then read a paper entitled "Notes on the Diseases affecting Foreigners in Yokohama, upon the basis of Ten Years' Statistics of the Yokohama General Hospital."

The Chairman said that he had listened with both pleasure and profit to the paper, which quite tallied with his own experience. He had seen but two cases of erysipelas, and none of scarlet fever; in one case the skin had the appearance of scarlet fever, but it was unaccompanied by any affection of the throat. Among Japanese there was a very great deal of consumption, but it seemed confined to men, for although of the six thousand patients whom he had seen in the last year a very large proportion were women, there had been only one case among them. There was a good deal of chronic rheumatism, with swollen and deformed joints, and much muscular rheumatism, but only one case of the acute articular type. Comparing his experience in the United States with what he had seen here, he thought that the climate and the conditions of life of foreigners in Yokohama were favourable to infantile life, and he was making the comparison not with large towns but with healthy villages. Among the Japanese, however, the rate of mortality for children was extremely high owing to the mode of bringing up, and the want of comfort, care and proper nourishment, and to exposure to the rays of the sun. He had been into numberless farm-houses, and rarely found that there were more than two or three children, and he was assured that when more had been born, at least one half did not survive beyond infancty.

Dr. Goertz thought tha additional interest would have been imparted to the paper, if the author had mentioned three more diseases, namely Lacquer-poisoning, Fish-poisoning, and Eye-disease.

Dr. Eldridge replied that he had confined his paper chiefly to diseases affecting life, and though Fish-poison often pro-

Digitized by Google

duces death, it had already been so fully treated in a valuable paper by Dr. Goertz that he had felt it unnecessary for him to touch upon it. He would, however, accept the suggestion of Dr. Goertz before publication of the paper. He would be glad if the Chairman, whose experience in Eye-disease was far larger than that of anyone else present, would give his opinion as to its frequency among foreigners.

The Chairman said that he had seen here two epidemics of catarrhal opthalmia, and there was always much among the Japanese, but although foreigners, especially foreign children, were so much among them, he thought that it rarely attacked them. He did not think that there was more eye-disease among foreign children here, than among children in America.

Dr. Goertz dissented from this view, though of course eye-disease here, even among Japanese, was not so common as in the extreme north of Europe, where in the villages of Lapland and Finland hundreds of children are blind.

Dr. Latham proposed, and Mr. Hartley seconded a vote of thanks to Dr. Eldridge for his interesting and valuable paper, which was carried by acclamation.

The meeting then separated.

Digitized by Google

THE KOREAN POTTERS IN SATSUMA.

BY

E. SATOW, Esq.

Read before the Asiatic Society of Japan, on February 23rd, 1878.

There appears to be good ground for believing that Korea once enjoyed a much higher degree of material civilisation than, as we learn from recent sources of information, is the case in the present day, and when we consider the extent of the ruin wrought in that peninsula by the Japanese armies in the end of the sixteenth century, and the general difficulty experienced in countries where the civilisation is Chinese of recovering from such disasters, we shall not be surprised to find the modern Koreans far behind their neighbours in the practice of the useful arts, though in former ages it was to them that the Japanese went for instruction. One of the arts brought to this country from Korea was that of pottery, and those who have seen specimens of the delicate white translucent Korean ware, to which an antiquity of about five centuries is assigned, will readily admit that the Korean potters possessed in those days a degree of skill which was worth imitating and secrets which were worth the sacrifice of much money and pains to obtain. The Japanese, always ready to learn from others, have, from a period which may be called pre-historic, at various times invited Korean artisans to settle in this country,

Digitized by Google

and several schools of pottery are said to have been founded by these immigrants. As the learned antiquary Ninagawa Noritane tells us in Part V. of his invaluable work on the history of Japanese faience, the common sort of pottery called *raku-yaki* was first made by Koreans whom Hideyoshi caused to be brought to Kiyauto. The kilns in which it was baked were built in his palace of Jiuraku, whence the ware took its name. The descendants of others who were settled first at Agano in Buzeñ, and later at Yatsushiro in Higo, after the withdrawal of the Japanese troops from Korea in 1598, still carry on the production of Agano ware. Another Korean was the first maker of Nakanokura ware, near Hagi in the province of Nagato, and became the founder of a family which still exists there, and in the province of Satsuma there is a village entirely inhabited by potters of Korean origin, whose forefathers were transplanted from their native country about the same time.

The ancestors of these people were brought over in 1598 by Shimadzu Yoshihiro, the feudal lord of Satsuma, and settled at Kagoshima, the capital of the province, and at three villages named Kushikino, Ichiku and Sañnogaha in the department of Heki. Some of them were afterward removed to Chiyosa in Ohosumi, on the Kagoshima gulf, where they continued to exercise their art, and their descendants live there to this day. The larger number were collected together in the end of the year 1603 at Nahashirogaha or Tsuboya, a village on the high road from Ichiku to Kagoshima, about twelve miles from the latter town. They belonged to seventeen families named 伸 Shiñ, 李 Ri, 朴 Boku, 卞 Heñ, 姜 Kiyau, 鄭 Tei, 陳 Jiñ, 林 Riñ, 白 Haku, 崔 Sai, 沉 Chiñ, 盧 Ro, 金 Kiñ, 何 Ga, 丁 Tei, 車 Shiya and 朱 Sai, and their descendants still keep these surnames, which are pronounced as above according to the Japanese fashion. The personal names in use among them are usually composed of two Chinese syllables, according to the Korean practice, but the women bear Japanese names, such as Fude (Pen), Yuki

Digitized by Google

(Snow) and the like. The whole population of the village numbers about fifteen hundred.

The wares made by the first generation of captives were chiefly of a coarse kind of dark pottery with a black glaze, and this manufacture is still carried out at Tsuboya, the principal articles produced being teapots, pipkins and large jars for packing the dried tea leaf. Between the years 1624 and 1644 a skilful workman named Boku Teiyou made the discovery of white sand at Kaseda and of white clay at Ibusuki, and from this period dates the manufacture of the white Satsuma cracked ware (called *hibiki-de*) so much esteemed by European connoisseurs. But for a long time the wares appears to have been ornamented very sparingly with colour, and the oldest specimens are altogether devoid of it. About the close of the eighteenth century a Korean named Kiñ Zenkai and Kuhabara Jiuzawemoñ, an inhabitant of Kajiki, made a journey to Kiyauto where they learnt the art of decorating earthenware with figures, landscapes and set patterns in the style of colouring called *nishiki-de*. This is the sort by which the Satsuma ware has acquired its great reputation. Most of the fine pieces in this style were produced at some potteries established by the prince of Satsuma at a place called Tatsuno, whence they were removed six or seven years ago to Tanoura, a village on the bay about a mile to the east of Kagoshima. The ware was manufactured regardless of expense for the prince's own use, or for the presents to the *Shiyaugun* and to his fellow *daimiyau*, to which circumstances is owing the great perfection to which it was brought. Connoisseurs distinguish it by the richness of the gilding, the delicacy of the drawing and subdued harmonious colouring. During the last few years the painted crackle has been made by private individuals, or by companies trading with funds advanced by the local administration, with a view to profit, and it would perhaps not be too much to say that nothing worthy of the collector's attention has been produced since 1868, the year of the revolution.

Digitized by Google

In February of last year I had an opportunity of visiting the Korean village of Tsuboya, where I was most hospitably lodged and entertained by one of the inhabitants, to whose care I had been specially commended by a Japanese friend. There is nothing distinctive in the appearance of the people or in the architecture of their houses to attract the notice of a passing traveller; they all speak Japanese as their native tongue, and wear Japanese dress; Tsuboya is in fact just like any other village. The principal potteries belonging to the Koreans are situated on the side of a hill to the south of the high road, together with the kilns belonging to the Tamano-yama kuwaishiya, a company recently started by some Kagoshima *samurahi*. The Tsuboya crackle is produced at this establishment and at another on the opposite side of the road owned by a Korean named Chiñ Jinkuwañ, but most of the villagers devote themselves to the manufacture of common brown earthenware. The principle of the division of labour seems to be thoroughly well understood and applied by these workmen. One will confine himself, for instance, to the bodies of tea-pots, of which he can produce about a hundred and fifty in a day, another makes the lids, a third the spouts, a fourth the 'ears' or projecting pieces into which the handle is inserted, and to a fifth is assigned the joining of these parts together. Generally the members of a family work in concert, and form a sort of co-operative society, which is joint owner of a kiln with other such societies. The clay used for the coarse ware is found at Isakuda and Kañnogaha near Ichiku, and at Terawaki, Kukino and Noda near Ijifu-Iñ, all in the neighbourhood of Tsuboya. Chocolate coloured, red and green glazes are obtained from Tomura, Kañmuri-ga-take and Sasa-no-dañ, while Ishiki furnishes the glaze for water jars and other large articles of the coarser kind of ware. Three sizes of wheels are in use, the smallest of which is formed of two wooden disks about 3 inches thick, the upper one being 15 inches, the lower 18 inches in diameter, connected by four perpendicular bars somewhat over 7 inches long. It is poised on the

Digitized by Google

top of a spindle planted in a hole of sufficient depth, which passes through a hole in the lower disk and enters a socket in the under side of the upper disk, and the potter sitting on the edge of the hole turns the wheel round with his left foot. The largest wheel is about twice the size every way of the smallest.

The kilns are built up the face of a hill in parallel rows. Each is divided into a number of chambers with openings in the intervening partitions to allow of the passage of flame and hot air from the lower end of the kiln right up to the head, and there are apertures in the side of every compartment, a larger one for the ware to be passed in and out by, which is of course closed during the firing, and a smaller one through which the workmen in charge can watch the progress of the baking. The fuel is placed in the lowest chamber, which is about six feet square, and consists of split pine logs about two feet in length and a couple of inches in diameter. Two hundred and fifty or sixty bundles of wood are required for a single firing, which usually lasts about thirty-six hours. No stands are used for the brown earthenware while it is being baked, but the articles are piled on each other, every second one being upside down; they consequently adhere together slightly when brought out of the kiln, but a slight tap with a piece of wood is sufficient to separate them. Between the heavier pieces, such as the large jars, used for packing tea, small bits of dry clay are inserted to keep them apart. The glaze is put on by immersion, the article, as for instance a teapot, is dipped into the liquid upside down, in such a manner that very little gets inside, and then being quickly reversed is set on its base, so that the glaze flows down pretty equally all round. When dry the glaze is of a yellowish gray opaque colour, and it is put on before the article is subjected to any process of firing.

The material used for the finer kind of earthenware, that is, *saishiki-de* or painted ware, and *nishiki-de*, into the decoration of which gold enters as well as colours, consists of white clay from three localities, namely Mount Kirishima, Ibusuki and the gold mine at

Digitized by Google

Yamagano, of white stone from Kaseda and Kushiki, and of white sand from Kominato. Ibusuki supplies in addition a second kind of clay called *bara*, which is said to be very brittle, and no doubt is the ingredient which gives somewhat of the character of porcelain to certain pieces of the ware. The Kaseda stone is used also for glazing when powdered and mixed with the ashes of *nara* wood (quercus glandulifera), or some other sort of hard timber.

The clay and stone are well pounded, soaked in water and passed several times through a fine sieve placed over a receiver. The minute particles which settle at the bottom are then taken up and dried on boards. To this process is given the name of *midzu-boshi*, or water drying, and it is common to all branches of the manufacture. For the fine white earthenware four kinds of clay, together with *bara* and white Kaseda sand, which have been previously subjected to *midzu-boshi* are mixed in certain proportions known to the experienced workman. Lumps of this stuff are placed upon wooden blocks, and pounded with hammers to the extent of about three thousand blows, by which it is brought into the state of raw material, but previously to being actually converted into clay for the potter's use, it requires about three thousand blows more. It is considered to improve in quality the longer it is kept.

The kilns in which *nishiki-de* and *saishiki-de* are baked, are one-celled and built of clay upon a foundation of brick, with walls about six Japanese inches thick. Fire is kindled in the mouth of a passage which projects from the front of the kiln, and the hot air passes up this to the chamber, where it can circulate freely round the muffle in which the biscuit is deposited. The largest of these kilns have the following dimensions:

1° EXTERNALLY.

Height	5.5 feet (Japanese measure).
Diameter	4.5 „
Length of hot air passage	5.0 „

Digitized by Google

2° INTERNALLY.

Height	4.5 feet.
Diameter	3.5 „
Height of hot air passage	1.2 „
Width	0.9 „

A space of four inches in width is left between the muffle and the inner wall of the kiln. For *nishiki-de* three firings are necessary, firstly, the *suyaki*, after which the glaze is put on, secondly, the *honyaki*, after which the piece is painted and gilded, and thirdly, a slow and gradual firing which developes the colours, the duration being 24, 48 and 10 hours respectively. During the last firing the temperature is observed from time to time through an aperture near the top, the test employed being a piece of pottery marked with various pigments, which gradually assume the desired tints as the heat increases.

A memorandum drawn up by an official of the Kagoshima prefecture, for presentation to the commission which presided over the Industrial Exhibition held last autumn in Yedo, gives the composition of the pigments used for producing the various colours of the fine Satsuma wares. Dr. Edward Divers, professor of chemistry at the Imperial College of Engineering, has kindly examined specimens of these materials procured in Yedo, and has furnished me with their English names. The mixtures for the various colours are as follows:

Red:—Ground white glass, soft or lead variety (*shiratama no ko*); white lead (*tau no tsuchi*); colcothar or red oxide of iron (*beni-gara**) and a silicious earth called *Hino-woka tsuchi*.

Green:—Ground white glass; white lead; copper oxychloride (*roku-shiyau*) and silicious earth.

Yellow:—Ground white glass; red lead (*kuwaumeitan*); silicious earth and metallic antimony (*taushirome*).

---

* Dr. Divers informs me that *benigara* is a corruption of Bengal, whence this substance was formerly obtained.

Digitized by Google

White :—Ground white glass, silicious earth and white lead.

Blue :—Ground glass and smalt (a ground blue glass, the colour of which is due to a cobalt compound ; the Japanese name is *hana-konjiyau*).

Purple :—Ground white glass, white lead and manganese.

Black :—Ground white glass, white lead, an earthy manganese ore containing a little cobalt (*wensei*) and a very silicious carbonate of copper, apparently ground and elutriated malachite (*shihonuki-rokushiyau*.

At the pottery belonging to Chiñ Jinkuwañ I saw groups being modelled in the white clay, which after baking and glazing assumes a light cream colour and becomes what is known as Satsuma crackle. These articles were intended to be decorated later on with gilding and colours. The potters here possessed only two old pieces of plain ware, a *teuji-buro* and a figure of a child playing with a diminutive puppy. The *teuji-buro* is an utensil formed of two pieces, namely a brasier and a boiler on the top of it, and is intended for distilling oil of cloves, though in practice it is used merely as an ornament. Two artists were employed in modelling figures of Kuwañoñ (pr. Kannoñ) and Dharma in white clay, with the conventional face and robes given to Buddhist personages, and toes all of the same length. A third was engaged upon a tiger, sitting-up in a cat like posture, intended to be two and a half Japanese feet in height when finished. Most of their figures are modelled from drawings in Indian ink, but the coloured designs are laid on from memory. Until fourteen years ago a ware called *betsukafu* (pr. *bekkô*) *yaki* was made at this village, the colours of which were intended to imitate tortoise shell. It was a common ware, and used to be exported to Nagasaki in large quantities. A piece of this said to be old, which was exhibited to me, had green blotches, as well as the two usual colours, yellow and brown.

At the Tamanoyama company's establishment all sorts

Digitized by Google

of ware are produced, common brown pottery, inferior blue and white and highly gaudy crackle. Here I found a workman engaged in modelling a statuette of Christ after a sentimental woodcut in a religious periodical called the "Christian Observer"; he had copied the face and beard with considerable accuracy, but had draped the body and limbs in the robes of a Buddhist priest. Some stoves of brown earthenware imitated from American iron stoves, were already ready for the kiln; their price was to be seven dollars delivered in Yedo. I saw also some huge white vases of monstrous shape, composed of hexagons, circles, squares piled up as it were pell-mell, the result of an attempt at originality, unhampered by traditional notions of form.

The account given of themselves by the *Kaurai jin* (as they are called) is that all the inhabitants of the village, peasants as well as potters, are descended from Koreans brought over during the period Keichiyau (1596-1615) by a Satsuma *samurahi* named Ijifu-Iñ. Until about three years ago they wore their hair tied up in a knot at the top of the head, but most of them now wear the Japanese queue, or cut their hair in the style which has been introduced from abroad. They informed me that in former days they dressed themselves in their own costume on special occasions, as for instance when they went forth to salute the prince of Satsuma as he passed through their village on his way up to Yedo. One of the potters was good enough to put on this dress in order to give me an idea of the appearance which they presented. He began by drawing on a pair of wide trowsers of dark blue silk, of a very delicate material, differing from the ordinary Japanese *hakama* in having no division between the legs, but tied on in the same way, that is, the front part was tied on by strings which passed round the waist, and then the back piece was fastened by strings in a double bow-knot in front. Next he threw over his shoulders a wide-sleeved mantle or *haori* of like colour and texture, the sleeves of which were not sewn up in pockets, as those of the clothes worn by adult Japanese usually are, and fastened

Digitized by Google

it with strings on the right side of the waist. Finally, he crowned himself with a long conical black cap, edged with white. He also produced a broad-brimmed black hat, apparently woven of the stem of a kind of creeper. The knowledge of the Korean language is still kept up by some among them, whose duty it is to interpret between castaway Korean junkmen and the Japanese officials. Before the destruction of the monasteries, the inhabitants of the village belonged to the Buddhist sect, Teñdaishiu, which was no doubt that of their ancestors in their native country. At present they are under the protection of a Japanese deity, whose shrine, called Giyoku-sañ-Guu, stands on a hill southwest of the village. In front of the shrine stand a couple of lanterns of white ware with a blue design, presented by the potters belonging to sixteen out of the seventeen families, as may be seen by the names inscribed on the pedestals. The tombs in the cemetery, which lies at the side of the path to this temple, do not differ in any marked manner from Japanese tombs, which is what we should expect to find, as the style of sepulchral monuments in Japan is essentially Indian Buddhist, and most likely derived through Korea. It appears that these people marry freely amongst themselves, identity of surname not being considered an obstacle, as it is in China, but seldom intermarry with Japanese, except they be members of the *samurahi* class. I gathered, in fact, from the conversation of the villagers, that they considered themselves much superior to the aboriginal natives of the country to which their ancestors had been transplanted.

Digitized by Google

RULES FOR PRONUNCIATION OF WORDS IN THIS PAPER.

au is ô.
ou is ô.
ten is chô.
shiya is sha: shiyau (=shau) is shô (in a Chinese word).
chiyo is cho (in a Chinese word).
w before e is not sounded.
f in the middle of a word is not sounded.
h before a or o in the middle of a word is pronounced w.
h before i in the middle of a word is not sounded.
ñ is the final n of French, with a tendency towards English ng, but,
ñ before m is m.
ñ before n is n.
in Yedo kuwa is sounded ka; hence kuwau (=kau) is sounded kô.
tsu before k in Chinese compounds is k.

Digitized by Google

Digitized by Google

BIOLOGICAL NOTES.

BY

H. FAULDS, L.F.P. & S.

Read before the Asiatic Society of Japan, on February 23rd, 1878.

The following notes have been made during the last four years residence in Tôkiô, and are recorded in order to stimulate further discussion and research as to the points indicated.

Anthropology.

As illustrative of the rapid influence of new occupations in inducing class manners and expressions, I have observed frequently amongst the *shoemakers* here those very attitudes and characteristic expressions which some have imagined to have been in the West chiefly of *hereditary acquirement.* Some of these people began to make shoes only a few years ago. A similar observation might be made in regard to the weavers in Ginza, whose occupation, though ancient indeed, is carried on now in brick houses with small windows and low roofs, while the ordinary Japanese house is open to the external atmosphere. The great toe of the Japanese who formerly always wore sandals of various kinds is spread out, a fact which the skilful artist who illustrated Hall's voyage to the Loochoo islands in which a similar custom prevalled, does not seem to have considered, as he represents the great toe to be turned in, as boot-wearing peoples' toes are. I have seen some few

Digitized by Google

great toes here somewhat turned in from wearing boots, though that custom had been very recently adopted. It is not yet very common.

These facts may be interesting in view of Darwin's recent admission that he had allowed too little in early editions for the capacity to vary in *individuals*, without the aid of hereditary influence.

It is a curious fact, I think admitted by most surgeons, that the wounds of the Japanese have considerably less tendency to suppurate than those of, for example the Xanthocroic races. I have been very much astonished to find how rare Bright's disease is in Tôkiô. In four years, with good opportunities in a public dispensary, I have not seen a single case. Transient albuminuria I have seen very frequently. In one case I believed there was Bright's disease, but after the patient, a woman, had been in hospital for some time her symptoms entirely disappeared, and I have heard that she is still well.

Is there any connection between these two sets of observations? In chronic Bright's disease as many hold, as Lister contends, and as I myself in the Royal Infirmary of Glasgow have oftentimes verified, there is very commonly a history of long continued suppuration. Prof. Lister, the founder of antiseptic surgery, who aims by this system to prevent germ-putrefaction of wounds and so remove the commonest cause of suppuration, believes also that he saves his patients from the future danger, years after his wounds have healed, of Bright's disease, so common and fatal in England.

Has my experience in Tôkiô been unique? If not, and if others should come to the same conclusion, may not the absence here of those special germs which cause putrefaction be the true account of these phenomena?

Dr. Taylor of Kiyôto, a careful observer, has kindly informed me of two fatal cases of Bright's disease occurring in Kiyôto. I have heard from Japanese medical friends that during the war, at least, suppuration was very common and severe in the western parts of Japan. Now when the antiseptic theory is of more than European

Digitized by Google

interest, it would be well to have facts on these points. It is well enough known that particular wards in a hospital have a greater percentage of suppurating wounds than others. It would therefore not be strange to find localities vary in this respect, but nothing has yet been done in the investigation of this field.

Race *has* some influence on pathological processes. I have frequently had occasion to blister Japanese patients and many of them were dark skinned, but I have never found the blistered area to become white, as frequently happens in the negro for example. In fair skinned Japanese, as in English people, pigment is accumulated in the blistered part, and permanent staining, of a very decided character is often the result, a fact of practical importance where a lady's face has to be operated upon.

In this regard a case of Leucoderma of considerable interest occurred to me. In this affection I hardly think that it could be proved that the whole pigment of the body is increased, nor, as in albinos, actually diminished. That it is simply rearranged, grouped together in dark masses, while other parts of the skin are left whiter than usual, is rendered still more likely in this case from the fact that the edges of the dark patches are darker than their centres. The white parts are of abnormal whiteness, the central parts of the dark patches are not darker them the skins of Japanese usually are, but the broad edges are decidedly darker. Again, a comparison of the annexed drawing compared with that of the negro woman whose case Tilbury Fox (in his Treatise on Skin Diseases) selects as typical of Leucoderma, will show, that where the negro woman shows white or locally diminished pigment, there almost regularly my Japanese appears dark, and vice versa. There is not absolutely this contrast, but there is a very near approach to it.

Lister long ago pointed out the amoeboid or migratory movements of pigment particles in the frog's foot, and these investigations have since been turned to very good account. That the absolute quantity of pigment should remain unchanged while its local distribution varies with

Digitized by Google

pathological conditions of the skin, would be quite in harmony with these early observations of Lister, to which many others have added. In this view the condition called Leucoderma is not much more entitled to be called a disease, than freckles on one's face in summer, or the spots on a piebald horse. My patient was healthy in all his organs, but imagined he had been stricken with Leprosy.

The absence of Deformities in Tôkiô has recently been alluded to (by Professor Morse, in Pop. Sc. Monthly, p. 284, 1878). Deformities are of two kinds. Some of them are the result of interference from without, such as accidents, or conservative surgery. Others again, arise from the arrest, perhaps sometimes from the perversion, of natural evolutionary process in the growing organism. With the first the biologist has directly little to do. Yet considering the absence of railways and machinery, they are not very uncommon here. No doubt, however, in a country where scientific surgery has been neglected many will be allowed to die, who would otherwise have entered into life halt or maimed. The recent war, for example, has left a large number of men with deformities of this kind. Congenital deformities are of intense interest to the biologist, and of great value for the students of evolution—a theory of which I am an ardent upholder though some of its conclusions seem to me illogical and false. Many of these deformities, as hare lip and cleft palate, simply preserve and retain a condition which all of our bodies must pass through on their way to developed perfection. The history of this race in its long isolation from the world is peculiar, and a special interest belongs to their natural history although but few observation have yet been recorded.

I have found two cases of hare lip only in my practice but have seen three or four others. It does not seem to be known that the condition is curable. There was no cleft palate in the two cases referred to, nor have I seen a case of that kind in Japan. This condition (hare lip) seems to be rarer than in England.

I have been informed that supernumerary fingers and

Digitized by Google

toes are common in Japan but have seen no case as yet. As in other cases of growth etc. the priest sometimes deprives them of blood by a tight ligature, and they separate by gangrene. I have seen warts, etc., which had been very painfully and ineffectually treated in this way. Hernia is quite of frequent occurrence in Tôkiô, and umbilical hernia is of extraordinary frequency. I have seen no other deformity in the central line of the body. The fontanelles close as readily I think as in English children. I have seen as many cases of hydrocephalus as I would expect to find in the same number of patients in a British dispensary. Two of the cases were very severe.

Is there any anatomical variation in the Ileo-caecal valve of the Japanese? Obstructions there have been exceedingly common in my experience. I am aware that the eating of raw fruit, etc., is supposed to account for these effects, but in no single case observed by me, was there a clear history of any such indulgence.

Great interest has within the last year been excited in cases of failure to close of those brachial clefts which the young human being possesses at one stage of his existence, as the fish does in maturity. I was once consulted by letter as to such a case by a country doctor in Japan, but the report is hardly precise enough to be of any scientific value except as an inducement to search for others.

In regard to all such malformations, what effect may we attribute to the early marriages of Japanese, a cus- which some have argued would render them less common? It must be evident that as yet we have few observations on which to form any wide or sure induction.

In Japan wavy-haired people are found pretty often. Those I have seen had all black hair and dark brown eyes and were pure Japanese, none of them having any of the characteristics of the Malanous races. The children of mixed Japanese and European parentage have generally dark brown hair. I have seen none as yet with fair hair. All young infants here, as elsewhere (a fact, however, sometimes forgotten even by specialists in that department)

Digitized by Google

have eyes of neutral tint. I have had no opportunity of making skull measurements.

A curious fact has come under my notice in this city. In Tôkiô the breasts of young infants not unfrequently contain a small quantity of milk. More important still is the undoubted fact which I have myself carefully verified that some of these infants are males. Of children born in Tôkiô of purely Japanese parents, I have found on enquiry that the midwives of largest experience estimate that about 5 per cent. are born with breasts which yield a little milk in early infancy. Of these about 2 per cent. are males. These numbers, of course, are open to question, but I believe they are likely to approximate to the truth. Of the fact itself I can have no doubt at all. On the basis of this curious phenomenon, I would hazard a crude conjecture that the existence of breasts in the male which has hitherto been such a stumbling-block to both teleologists and evolutionists, may be closely analogous to the survival of other organs, whose primary function like that of the thyroid gland, and suprarenal capsules, is an unknown factor in fœtal or infantile development, and that while the gland fulfils only this unexplained office in the male, it has also been conserved, by design or by selection, for a secondary, but not less important function in the female. Sir James Paget's principle, that each organ in selecting its peculiar elements becomes an excretory organ for all the others, is in close relation to the conjecture which I have just thrown out.

The teeth of the Japanese present great irregularity, yet some of their very abnormalities I feel persuaded will be found subject to the sway of evolutionary laws. The last molars of the lower jaw are often found pressing forwards on their anterior fellows, almost horizontally.

The notched specific teeth of Hutcheson are common. They are usual associated with the conditions which accompany them elsewhere, such as scarred edges of mouth, diseased corneæ, etc. I have met with two curious instances of what is called by teleologists, compensation. In both cases (adult men) the front lower incisors had become loose

Digitized by Google

from gum disease, and large, smooth, accurately moulded buttresses of cretaceous matter had arisen to prop them forward. I certainly thought the first one was the ingenious work of a Japanese dentist, but it was found to be the result of what might be called a natural process.

Stillé in his work on Therapeutics records some cases of patients apparently by *instinct*, discovering remedies suitable for their ailments. One man, an ignorant peasant from the country around Tôkiô, in this way thought that shell-lime would cure a particular stomach complaint. He had no theory or tradition to work upon, but he was nearly right, and on medical grounds had to be treated with a similar remedy. Such a function belongs rather, one would think, to mere animals, but is manifested now and again by highly developed individuals in highly civilised communities.

Without going beyond the province of the biologist, many questions arise in a country like this as to the natural history of disease. What is the effect, we might enquire, of vaccination and other sanitary improvements on the whole infant (and general) mortality of the people? Have new diseases stepped in to keep up the average, or has there been an actual diminution of the general mortality, as seems to have been the case in England, and which the *Lancet* justly ascribes to real sanitary progress?

Anthropological data of a very valuable character might soon be gathered together by the numerous skilled observers now in Japan, such as regards measurements, endurance, longevity, etc. (and the curious custom of preserving the umbilical cord with the attached register of birth, etc., would perhaps guarantee more reliable observations in Japan than elsewhere). I hope soon to lay before this Society some observations on Japanese vision, the notes of which are somewhat advanced.

I have observed and identified a large number of parasites of man found in Japan, as in the Table subjoined.

Digitized by Google

I.—Vegetable Parasites.

Parasite.	*Disease.*
1.—Archorion Schönleinii.....	Tinea favosa or porrigo.
2.—Tricophyton tonsurans.....	Tinea tonsurans or ringworm of scalp. Tinea circinata or ringworm of body. Tinea Kerion is also common but I have not looked for the parasite in those cases.
3.—Microsporon Audouini.....	A form of alopecia or patchy non-symmetrical baldness.
4.—Microsporon furfur	Pityriasis versicolor.
5.—Sarcina ventriculi or Merismopœdia ventriculi.....	?(Found in stomach affections but not now supposed to cause them).
6.—Algæ.....	Affections of the mouth.

Others, such as yeast fungus I might add, but they are not usually included.

II.—Animal Parasites.

1.—Pulex Irritans or common flea. It is softer than the English one, but I have not detected any important variation in its structure.

2.—Pediculus or louse. I have found the three usual forms viz :

P. Corporis, P. Capitis, and P. Pubis.

3.—Acarus, or Sarcoptes scabiei, which produces the disease called Scabies or Itch from which almost no class in Japan is exempt.

4.—Ascaris Vermicularis, or thread-worm.

5.— „ Lumbricoides, „ round- „

6.—Taenia Solium, „ pork tape worm.

7.—Cysticercus, „ undeveloped form of the preceding.

8.—Bothriocephalus latus—(I am now doubtful of having observed this worm, but a competent observer found it to be common in the interior, towards the north).

Digitized by Google

I have not seen Acarus folliculorum, but expect that it will soon be found here. Cases of chyluria have recently been reported to me from Hakodate and elsewhere. This condition is now known to be of parasitic origin.

In the above list, the result of many careful microscopic and other observations, it will be seen that the parasites of man in this country are those observed in the British isles with perhaps the exception of Both: latus, which is very rare in England.

Some observers have contended for the transferability of parasites as a means of marking oneness of race, an opinion, which if it seems to hold true within certain very narrow limits, is hardly likely to gain ground. At all events, if that be a good mark, it must now appear certain that the Japanese and the English are of one race.

The bed-bug (cornex lectularia) is said to have appeared a short time ago in Japan. It seems to have first entered London after the great fire in 1666, and was thought to have come along with a cargo of wood from America. I trust its mortal enemy, the dust covered *Reduvius personatus*, may soon follow to keep it in check, as the Japanese mats may give it too great advantages in the struggle with man. The Bothriocephalus latus or broad tape worm is thought to be derived from a parasite which inhabits the Dorse or Baltic cod, and hence it is very common in Russia and Poland, but why should it prevail in Switzerland? It strikes me that perhaps bear's-flesh might have something to do with it. This is eaten in Japan and all the other countries in which this worm prevails. I cannot say that I have positively identified one case of this worm in Tôkiô.

In Fiji Dr. MacGregor has recently traced a disease which is very common and fatal amongst the natives to a parasite contained in the Holothuria or sea-slug (Beche-de-mer). The disease in not a few points resembles the Japanese affection called Kakké, which Dr. Anderson a short time ago so well and ably brought before this Society. One case was related of a sailor coming from a district of Japan where Kakké was unknown, residing in Tôkiô for

Digitized by Google

a short time where it prevails greatly, and who afterwards sailed for San Francisco. Not till long after leaving Japan did symptoms of the disease manifest themselves. This fact is quite in harmony with the known laws of parasitic affections, and the progress of these investigations during even the last twelve months should encourage us to a still closer hunt for the parasites which may cause particular diseases. I by no means imply that *Holothuria* has any connection with Kakké, but many such investigations may yet lead to clearer views regarding this mysterious and destructive malady.

Zoology.

It is desirable that our Society's Transactions should contain a record of 'finds' both in zoology and botany, and that their dates and localities should be recorded.

Fish. I have seen a large sturgeon *(Accipenser)* which was captured off Tôkiô. The plates were beautifully marked with furrows. The hammer-headed shark (Zygaena) is pretty often seen in the bazaars. Does any one know where they are caught and how? Its habits are not yet well understood, nor is the reason known why its eyes are placed at the ends of the 'hammer.' It is said to inhabit profound depths and to rise up suddenly to the surface.

I am able to show here specimens of the nest-building stickleback of Japan (Gasterosteus). It seems to be exactly the same as those found in English river.

Edwards first pointed out its unfish-like habit of building nests in 1838, but this seems to have been early known to the Japanese. I have not yet seen any of their nests here. This is another Japanese fresh water species presenting similar characters to those of European waters. How did these fish if separately developed, acquire similar organic structure and similar instincts? This is a question for Darwinists.

Two summers ago, in crossing by ferry a level mud bottomed and very shallow portion of the great bay of Owari, I saw great shoals of minute flying fish. I did not succeed in getting any specimens. Their flight was long,

Digitized by Google

and like that of the common flying fish (Exocœtus). They seemed to be about one inch in length.

Spiders.—On the Tôkaido near lake Biwa and onwards there is a species of spider which spins threads of enormous thickness and strength, which give sensible resistance when passing along the Tôkaido, there lined with rows of ancient pine trees.

During this autumn I have noticed a spider which I think illustrates the law of protective imitation. It is of a pale, dirty yellow, and by the mode in which its legs are arranged closely imitates ears of withered grass, amongst which I first observed it.

The nests of the common garden spider (Epeira) are common here and closely resemble those found elsewhere. They are like little bags of brown tissue paper. Little care is taken to protect or hide them.

I found a spider's nest composed of a ball of fine woolly filaments in which a number of young spiders were moving about. They seem to belong to the spotted geometric species. In one webbed nest I found a chrysalis which seemed to have been *stunned* but not poisoned: a process of preserving fresh meat with which spiders have been long acquainted. (Specimens were shown.)

Insects.—In Tsukiji I have found cases of the Psyche muscella. They were covered outside with minute twigs of Japanese larch (Larix leptolepis) to which tree they were glued. They were lined with a soft felty substance and the twigs had a right-handed spiral arrangement. (Specimens shown.)

White cotton-like excrescences are very common in Tôkiô on the common wormwood (Artemisia). They are caused by a species of cynips or gall-insect. (Specimens shown.)

Another gall which I show was found by me on a tall kind of box tree which is very common in Japan. It produces a dark blue berry. The leaves are not so bright green nor glossy as are those of the common box. This gall has several rounded openings with smooth elevated rims of a lighter colour than the body of the gall, which resembles

Digitized by Google

the bark of the tree. This I presume is also caused by a *Cynips*. I have seen others galls of the same kind and suppose the species may not yet have been described.

I found last summer in Tôkiô two bits of twig on which are fixed a number of light fawn coloured coriander seed-like little bodies, flattened on their attached surface and not unlike cowries in general shape. They have shallow, indented, parallel lines running down from the central longitudinal line of the back, or outer surface to the margins of the attached face. They are about one line in length and rather more than half that breadth. Unfortunately both twigs and organisms were dead and dried when I saw them first. (Specimen shown).

While spending a day or two in Nikkô during last June I found a nest of a species of wasp (Polistis gallica) which was busy depositing a drop of honey in each cell. The nest was attached by a dark tough stem to a bare cliff and contained some thirty cells. (Specimen shown).

The nest of the mantis religiosa is in England a rare curiosity and is wanting in many good museums. I have been fortunate in finding two of them this year. They illustrate very well I think the individual intelligence (as insects' nests often do) of the animal in adjusting its nest to the particular environment. One of these nests shows that the insect has even had the audacity to adjust the environment to the nest. It is built on the *convex* surface of a kind of evergreen with poplar-like leaves, which is called *Sasanka* by the Japanese. Some of these leaves were fastened so as to form a roof from which the rain might be shed. The other is fixed to the concave surface of a split bamboo forming part of a fence in Tsukiji. It was hardly to be distinguished in colour from the bamboo. These nests, existing in opposite conditions, have as nearly as possible the *same cubic capacity*. They were both about 5 feet from the ground. I have seen one of the nests give forth its little nursery of *mantides*, and at once they began to clasp their tiny hands in hypocritical prayer, an attitude of offence to other insects from which they derive their religious title.

Digitized by Google

The motions of the mature mantis which I have long observed are very uninsect-like. It lifts its hind legs to scratch its ears like a dog, and sometimes it turns its head round without moving the body like a horse. The Chinese are said to keep them, as our people used to do fighting cocks, for sport, their combats being very fierce and *bloody*. I do not know that this custom prevails in Japan. (Specimens shown).

I have seen a sketch drawn by a Japanese farmer in the country showing stems of grain hollowed out by a larva. It seemed like that of the corn-saw fly (Cephus pygmaeus) which would almost appear to be a new arrival in this country. Further particulars are wanted as to this destructive insect.

Digitized by Google

Digitized by Google

ASIATIC SOCIETY OF JAPAN.

A General Meeting of the Society was held at the Tôkiyô Shohei-kuwan, on Saturday, 23rd February, the President in the Chair.

The minutes of the previous Tôkiyô meeting were taken as read.

The Library Committee announced the receipt of various periodicals, and also that the American Oriental Society and Connecticut Academy of Sciences desired to exchange Transactions with the Asiatic Society of Japan.

Dr. Faulds mentioned that he had experimented on the question regarding the principal source of water pollution in the Tsukiji neighbourhood to which Mr. Atkinson had called attention. By arranging a set of metal pipes and well, he found that when the well was *undisturbed* no mixture of the water in the main and that of the well took place by regurgitation, as he had at first supposed. But on further imitating the exact conditions which practically exist, and *dipping model buckets* into the well, a very large contamination took place indeed, as proved by chemical re-actions. The walls contained a crystal of copper. The outflowing water passed over a crystal of yellow prussiate of potash, which showed by a deep chocolate colour any copper solution contained in the main. Cholera poison cannot be demonstrated in this way, but it is reasonable to suppose that it might be distributed in a similar manner.

Dr. Syle proposed the resolutions concerning the appointment of a Committee to consider the proper method of transliterating Japanese words in Roman character. Seconded by Dr. Murray, but when put to the Meeting was lost.

Dr. Faulds then communicated some Biological Notes.

The President thanked Dr. Faulds for his very interesting Budget of Notes, which were most varied in their character, and suggested to the members of the Society many subjects of useful enquiry. He begged to take this opportunity of mentioning how desirable it was that those members whose time or convenience did not permit of their drawing up papers, and who yet possessed fragments of information relating to Japanese manners and customs, natural history, traditions, laws, religion, education, etc., should furnish their observations to the Society in the form of short notes. The Society offered an excellent repository for such notes, which would be valuable not only for the information contained in them as far as that went, but also as suggesting topics of enquiry to

Digitized by Google

others, and in aiding those who might be giving their attention to the same or similar subjects.

Mr. Grigsby asked whether any cases of hydrophobia had come under Dr. Faulds' notice.

Dr. Divers had seen one case. It was commonly supposed that no injurious effects resulted unless the hydrophobic poison entered the blood, but Sir Thomas Watson had asserted that when merely resting upon the mucous membrane of the mouth, it might exert a poisonous action. In the case to which he had referred the poison had as usual been sucked from the wound, but without any bad effect.

Captain Brinkley thought that if hydrophobia had existed in Japan, its presence would have been expressed by some Japanese word, which was not the case.

Dr. Faulds had seen many bites from dogs in Tôkiyô and had followed their history as far as possible, but he had never heard of a single case of hydrophobia in the city. He had not seen the deformed little fingers in women to which Captain Brinkley referred. Frost bite, whitlows, etc., might cause some such deformity, or even injury to the nerves.

The President closed the discussion by suggesting that the members should present similar notes to the Society. Many gentlemen had information on Japanese subjects of great value, but which they might not wish to work up into a formal "paper"; but if they would present short notes, the Society would gladly welcome them.

Mr. Satow then read a paper entitled "The Korean Potters of Satsuma."

Dr. Syle referred to one passage in Mr. Satow's paper from which it would appear that the Koreans were now in a condition much inferior to what they had been formerly; and if so, they furnished another instance of that social and national deterioration which Sir John Lubbock admits with so much reluctance. In the case of Korea, peculiarly isolated as the country has been, it would be especially interesting to ascertain, if possible, what causes have led to this result, whether famines, civil wars, pestilence, or other damaging influences.

Mr. Satow said that in speaking of the deterioration of the modern Koreans he referred rather to their loss of material civilization, than to the disappearance of any intellectual characteristics. They were well known to be Chinese scholars of great proficiency.

Mr. Atkinson had felt great pleasure in hearing the paper which had been read. The high reputation of Satsuma faience had led to imitations being made, of which the best known were those prepared in Kiyôto. From the description given it appeared that the care bestowed upon the preparation of the Satsuma true ware was very much greater than upon that made in Kiyôto, for in the former case the clay is "tempered" by as many as 6,000 blows, while in the latter it undergoes very little mechanical preparation except washing. The principal differences between the Satsuma and its Kiyôto

Digitized by Google

imitation were to be found in the somewhat darker colour of the imitation, in the appearance of the "crackle," and in the style of decoration. The composition of the enamels used in painting the two kinds of ware appeared to be the same, except in the case of the black enamel, which in Kiyôto was produced by mixing ultramarine with the glass, siliceous earth, and carbonate of lead, which formed the basis of these enamels. In Nagoya, however, the black colour used for painting the Owari porcelain had the same composition as that prescribed in the paper.

Dr. Murray said that the relations of Korea to Japan were certainly of the most interesting description. Japan owed much in many ways to Korea, not only in the direction of industrial development of which Mr. Satow's paper had given a notable example, but in the development of her language, literature and laws. There was a curious instance of the existence of Korean elements in the population of Japan in a community within the bounds of the province of Musashi. It was called Koma-gôri, or the township of Koma, the name is said to be derived from Koma, one of the former kingdoms of Korea. The speaker had been informed by a Japanese scholar who had investigated the subject, that the little colony of Koreans who gave the name to this locality, were captives brought from Korea in the reign of Kwammu Tenno (782-807), and placed there for safe keeping. They had long since lost their national peculiarities and had become completely merged in the surrounding population. This township is located in the western part of this province, near the point at which the aquaduct by which the water supply is brought to the city leaves the Tamagawa.

The President in moving a vote of thanks to Mr. Satow remarked upon the interest which attached to Korean settlers who were found in various parts of Japan. The colony described by Mr. Satow numbered fifteen hundred persons, and after being settled in Japan for nearly three centuries they still possessed several of their national characteristics. The early civilization of Korea alluded to by Dr. Syle was too wide a subject to be described on this occasion, but it was a very interesting one, and one on which it might be hoped the Society would soon have an opportunity of acquiring some information. The deterioration of that civilization might be traced to war, both internal and with Japan, and in later times to the system of isolation to which Korea had so steadily adhered for nearly three centuries.

Digitized by Google

Digitized by Google

THE USE OF THE FIRE-DRILL IN JAPAN.

BY

E. SATOW, Esq.

Read before the Asiatic Society of Japan, on March 9th 1878.

The Japanese Museum at Yedo (Haku-butsu-kuwañ) possesses a copy of part of the archaic apparatus for kindling fire, called by archaeologists fire-drill, and in Japanese *hi-kiri-usu*, fire-drilling mortar. This consists of a wooden board measuring 1·58 feet in length, ·96 feet in width, and ·135 feet in thickness, according to Japanese linear measurement. A portion of the wood ·09 feet in depth and ·14 feet in width has been cut away from the upper surface of the board all round, and along the edge of each longer side of the upper step thus formed is a row of holes sixteen in number, which have apparently been made by a common carpenter's bit, ·04 in diameter and ·015 in depth, with a perpendicular slit in the wood down the outer side of each hole, probably cut with a saw. The upper surface of the board has been planed perfectly smooth, and the apparatus is altogether as far as possible removed from the original fire-drill as can well be imagined; it is in fact a very highly refined survival of an extremely rude primitive utensil.

In order to produce fire a pointed stick is rapidly twirled round between the palms of the hand in one of

Digitized by Google

these holes, and the burning dust formed in the process falls out through the slit on to the lower step, if one may judge by the condition of a portion of the example under description. Great exertion is required to raise the temperature of the wood sufficiently high to induce incandescence, and sometimes it is necessary for three or four persons to follow each other in turn before the desired result is attained. It is said also that in order to give greater rapidity to the revolutions of the drill, a contrivance called *rokuro* (pump-drill) is adopted. This consists of a light piece of wood about twice the length of the drill, with a hole in the centre to admit it, and with strings passing from its two ends to the head of the drill. The drill being once turned round with the hand, the strings twist themselves round it, and upon the cross piece being depressed with an effort, the drill revolves with great rapidity, untwisting the strings, which twist themselves round it again in the opposite direction as the operator allows the cross-piece to rise. Unfortunately, the apparatus exhibited at the museum possesses neither drill nor pump-drill. The wood of which the fire-drilling mortar is made comes from the *chamaecyparis* (or *retinospora*) *obtusa*, called in Japanese *hi no ki*, fire tree, from the well known fact that its wood can be kindled by friction more readily than that of any other tree.

The *hi-kiri-usu* is still employed at the present day for kindling fire for sacred purposes, at the Shiñtau temples of Watarahi in Ise, at the temple of Kasuga at Nara (whence the copy deposited in the museum was obtained), at Shimo- and Kami-Gamo near Kiyauto, and no doubt at many other temples of that religion where antique observances are held in veneration and preserved from oblivion. In the household of the high priest of the great Temple (Oho-yashiro) in Idzumo, who traces his pedigree as far back as the Mikado does, the fire-drill is still in daily use.

A passage in the Kojiki speaks of using the stalks or stems of certain kinds of seaweed as 'mortar' and 'pestle' for kindling fire, but it is difficult to suppose that any

Digitized by Google

kinds of seaweed can ever have been actually used for this purpose. Motowori, in commenting on this passage (Deñ, vol. xiv, p. 61), states that at the temples of Watarahi in Ise, fire is obtained for cooking the offerings in the following manner. A piece of wood from the tree already named is cut across the grain, and in a slight depression made in the block a piece of wood shaped like a carpenter's awl is twirled round vigorously. He says that the drill itself may be made either of *hi no ki* or of *yamabiha*, which my friend Dr. Itou Keisuke, the well-known botanist, identifies with Meliosma rigida, an evergreen tree found in various parts of Japan, particularly in the island of Kiushiu, and in the provinces of Kishiu and Shima, on hills near the sea. *Hi-uchi no ki*, the fire-striking tree is another name for it, but this is probably not to be interpreted literally as indicating the mode in which the wood is used. The form described by Motowori is evidently much earlier than that of the fire-drill mortar from Kasuga. Besides the passages quoted by him from various ancient books, proving the use of the fire-drill for religious purposes, the Riyau no Gige (令義解), or Commentary on the Administrative Law (833), in speaking of the annual festival called the Pacification of Fire (*Ho-Shidzume*), says that "the Diviners drilled out fire at the four corners of the Palace enclosure, and performed service in order to ward off the calamity of fire." Perhaps the flame thus obtained was then worshipped as the emblem of the Fire-god, but we have no information on this point.

A very full account of the kinds of fire-drill in use in various parts of the world will be found in Tylor's Early History of Mankind.

Digitized by Google

Digitized by Google

HIDEYOSHI'S INVASION OF KOREA.

BY

W. G. ASTON, Esq.

Read before the Asiatic Society of Japan, on March 9th, 1878.

Introduction.

The relations of Korea and Japan underwent great vicissitudes from their beginning in the first century B. C. until Hideyoshi's time. At an early date, Korea appears as the instructor of Japan in Chinese learning and in the arts of civilization. Koreans swelled the numbers of the army which under Kublai Khan attempted vainly to effect a landing in Japan in A.D. 1281. At other times we hear of Korea being overrun by Japanese invading armies, of its being governed in part by Japanese officials, or paying to Japan a heavy tribute in token of submission. From the union of Korea into one state towards the end of the 14th century under the protection of China, Japan and Korea met each other on equal and friendly terms for about two hundred years. Embassies bearing letters and presents were periodically exchanged between the two countries, and a trade was carried on by Japanese merchants of the island of Tsushima, who had an establishment at Pusan (Fusan), a town in that part of Korea nearest to Japan. For some years before Hideyoshi's accession to power, the embassies

Digitized by Google

from the Korean side had been discontinued owing to the reluctance of the Korean officers to undertake the voyage to Japan, which in those days must have been long and dangerous. Hideyoshi, considering this state of things derogatory to Japan, and no doubt also animated by a secret ambition of foreign conquest, despatched in 1582 a retainer of the *daimiô* of Tsushima, named Yuyaji Yasuhiro, as envoy to Korea to complain of this neglect, and to demand that the Koreans should send the usual embassies in future. Offence was taken by the Korean Government at Hideyoshi's presumption in making use of the character 朕 (*chin*) 'we,' which must have appeared to them an assumption of equality with the Emperor of China, and Yasuhiro's behaviour had no tendency to allay their dissatisfaction. On his way to the capital, he claimed the best rooms in the best inns, and stories are related of his taunting the Korean soldiers with the shortness of their spears, and insulting a gray-haired Korean noble by saying to him, "My hair (he was then 50 years of age) has become grey by many years of warfare, but what has turned yours grey who have grown old amidst music and dancing?" It is little surprising that an envoy of such a character failed in his mission. The Koreans refused to send the desired embassies, excusing themselves on the ground of the danger of the navigation, and Yasuhiro returned to Japan, where he and all his family were put to death as a punishment for his failure.

Nothing daunted by the ill-success of his first mission, Hideyoshi soon after despatched Yoshitoshi, the *Daimiô* of Tsushima, a young noble of high reputation, with two of his retainers, to the Korean capital, reiterating his demand that that country should renew the practice of sending embassies to Japan. After months had been wasted by Yoshitoshi in fruitless negotiations, he was privately informed that the Korean Government were hampered in forming their decision by a certain obstacle, and that if this were removed, a favourable reply would be given without further delay. It appeared that a few years previously some Japanese pirates had made descents

Digitized by Google

in several parts of Korea, and that not contented with plundering the villages and killing the military chief of one of the districts, they had carried off a number of the inhabitants to Japan. These Koreans became guides to the Japanese pirates in their predatory expeditions, and the indignation of the Korean Government at this was, it was said, the real reason for their refusal to send envoys to Japan. On hearing this Yoshitoshi lost no time in despatching one of his colleagues to Japan to bring back these Koreans to their own country, and had soon afterwards the satisfaction of handing over eleven of them to the Korean authorities, by whom they were at once tried and executed. The Government of Korea were highly gratified by this result of the negotiations; the king presented to Yoshitoshi a horse from his own stables, and the members of the embassy were entertained at a banquet and admitted to an audience of the king. Ambassadors to Japan were appointed after some time, and in the spring of 1590 they set out from Korea in company with Yoshitoshi and his colleagues.

After a voyage of three months they arrived in Kiôto, where they were lodged in the temple of Daitokuji. Hideyoshi was then absent on a campaign in the east of Japan. He returned in the autumn, but postponed granting an audience to the Korean ambassadors on the pretext that he must first repair the hall of audience in order to receive them with due ceremony. It was not till five months after their arrival that they were at last permitted to declare formally the objects of their mission. The ambassadors chafed at this delay, which it was obvious to them was promoted by Hideyoshi for purposes of his own, and their dissatisfaction was not lessened by the discovery that in Japan Hideyoshi was a subject like any one else, and that the homage due to the sovereign was reserved for the *Tennô* (天皇). He was not even called *Ô* (王) in his own country, but *Kwambaku* (關白), a term which was originally used in reference to the Chinese statesman *Kwakkô*, and meant Regent, not King or Emperor. Their resentment at the treatment they re-

Digitized by Google

ceived may be traced in the following Korean account of their reception by Hideyoshi :—

"The Ambassadors were allowed to enter the palace gate borne in their palanquins. They were preceded the whole way by a band of music. They ascended into the hall, where they performed their obeisances. Hideyoshi is a mean and ignoble-looking man, his complexion is dark, and his features are wanting in distinction. But his eyeballs send out fire in flashes—enough to pierce one through. He sat upon a threefold cushion with his face to the South.* He wore a gauze hat and a dark-coloured robe of state. His officers were ranged round him, each in his proper place. When the ambassadors were introduced and had taken their seats, the refreshments offered them were of the most frugal description. A tray was set before each on which was one dish containing steamed *mochi*,† and *saké* of an inferior quality was handed round a few times in earthen-ware cups, and in a very unceremonious way. The civility of drinking to one another was not observed. After a short interval, Hideyoshi retired behind a curtain, but all his officers remained in their places. Soon after, a man came out dressed in ordinary clothes with a baby in his arms, and strolled about the hall. This was no other than Hideyoshi himself, and every one present bowed down his head to the ground. Looking out between the pillars of the hall, Hideyoshi espied the Korean musicians. He commanded them to strike up all together as loud as they could, and was listening to their music, when he was suddenly reminded that babies could despise ceremony as much as princes, and laughingly called for one of his attendants to take the child and to bring him a change of clothing. He seemed to do exactly as he pleased, and was as unconcerned as if nobody else were present. The ambassadors having made their obeisance retired, and this audience was the only occasion on which they were admitted to Hideyoshi's presence."

* An assumption of royal style.
† A sort of cake made of rice.

Digitized by Google

The following letter from the King of Korea was delivered to Hideyoshi by the ambassadors :—

Riyen, *Koku-ô* (國王) of Chôsen, respectfully addresses the following letter to His Highness (殿下) the *Koku-ô* of Nippon.

This spring weather, with its genial warmth, is very agreeable, whether for rest or for exercise.

We heard from afar that the great king (王) had united under his rule the sixty provinces, and we were desirous at once to enter into relations and cement a friendship with him, thereby drawing closer the ties of neighbourly good-will. We feared, however, that the difficulties and dangers of the journey might prevent our envoys and the articles in their charge from reaching their destination, and we therefore abandoned this intention which we had entertained for many years. We now wish to present our congratulations by our three ambassadors *Kwô Inkitsu, Kin Seitsu* and *Konshin* whom we have caused to accompany your honorable envoys on their return to Japan, and we shall esteem it the highest happiness if our friendship remains undisturbed for the future.

You will find enclosed a list of some of the poor productions of our country, which we beg you will refrain from laughing at immoderately.

The rest we shall communicate when occasion offers. Meanwhile be careful of your health.

RIYEN of Chôsen.

Manreki 18th year, (1590) 3rd month.

The presents consisted of horses, falcons, saddles, harness, cloth of various kinds, skins, ginseng, etc.

Hideyoshi suggested that the ambassadors should return to Korea without waiting for an answer, but with this wish they were naturally very reluctant to comply. They set out, however, from Kiôto, and waited for Hideyoshi's answer at Sakai, the port from which they were to set sail for their own country. After a considerable delay it at length arrived, but was so insolent in its language that the ambassadors were obliged to send it back

Digitized by Google

repeatedly for alterations before it could be received. The letter was as follows:—

"This Empire was of late years brought to ruin by internal dissensions which allowed no opportunity for laying aside armour. This state of things roused me to indignation, and in a few years I restored peace to the country. I am the only remaining scion of a humble stock, but my mother once had a dream in which she saw the sun enter her bosom, after which she gave birth to me. There was then a soothsayer who said, "Wherever the sun shines, there will be no place which shall not be subject to him. It may not be doubted that one day his power will overspread the Empire." It has therefore been my boast to lose no favourable opportunity, and taking wings like a dragon, I have subdued the east, chastised the west, punished the south, and smitten the north. Speedy and great success has attended my career, which has been like the rising sun illuminating the whole earth."

"When I reflect that the life of man is less than one hundred years, why should I spend my days in sorrow for one thing only? ‡ I will assemble a mighty host, and invading the country of the Great Ming, I will fill with the hoar-frost from my sword the whole sky over the four hundred provinces. Should I carry out this purpose, I hope that Korea will be my vanguard. Let her not fail to do so, for my friendship with your honorable country depends solely on your conduct when I lead my army against China."

The tone of this letter, with the observations they had made during their stay in Kiôto, satisfied the Korean ambassadors that war with Japan was inevitable, and on their return home, they declared this conviction to their Government.

There is some indication, however, that, with all his bluster, Hideyoshi had some idea of pursuing a more reasonable policy. The colleagues of Yoshitoshi on his

‡ Hideyoshi's infant son had died a short time previously.

Digitized by Google

late mission to Korea were instructed to accompany the Korean envoys back to their country, and to endeavour to persuade that Government to assist Hideyoshi in renewing the long-interrupted relations with China. But the Korean Government rejected all overtures of alliance or mediation. The only question with them seems to have been whether they should keep the entire negotiations secret from China, in fear of the resentment which that power might show on learning that a protected state had presumed to hold independent communication with a foreign power, or whether warning should be given of the projected invasion. After much hesitation and delay the latter course was resolved upon, but before their messengers bearing the information arrived at Peking, news of Hideyoshi's intentions had already reached the Chinese Government from a different source.

The little island kingdom of Loochoo had attracted the cupidity of Hideyoshi, who, in the same year in which he received the Korean ambassadors, had sent the king of Loochoo a peremptory message through the *daimiô* of Satsuma commanding him for the future to pay tribute to Japan. Conscious of her inability to cope with either of her two powerful neighbours in war, Loochoo has never possessed an army or a navy, and the traditional foreign policy of this little state was comprised in the words "good faith and courtesy." The king, too, was young, and having but recently succeeded to the throne, was more anxious to devote himself to the internal affairs of his kingdom than to become embroiled in foreign quarrels. For the sake of peace, therefore, he sent to Hideyoshi an envoy with a ship-load of presents, which the latter was pleased to receive very graciously. The envoy, a priest, was treated with the greatest civility, and Hideyoshi condescended personally to impress on him the advantages Loochoo would derive from placing herself under Japanese protection, and ceasing to send tribute to China. He made no secret of his projects against that country, and the king of Loochoo, on the return of his envoy, requited Hideyoshi's candour by at once

Digitized by Google

despatching a warning message to the Chinese Government.

When Yoshitoshi learned from his two former colleagues the ill-success of their endeavours to prevail on the Koreans to comply with Hideyoshi's wishes, he resolved to make an effort on his own account to avert the war which he saw was impending. He was acquainted with the military resources of both countries, and knew that a war between Korea and Japan meant ruin to the former, a result which from his personal friendly intercourse with Korea he had no wish to see accomplished. On the other hand, a Japanese army, even if it conquered all Korea as far as the northern frontier, would only find itself engaged in a bloody contest with China, of the result of which Yoshitoshi was by no means so sanguine as his chief. He accordingly proceeded to Fusankai, where he arrived in the summer of the year 1591. He informed the Korean Government of Hideyoshi's preparations, and endeavoured to convince them that their only means of preventing war was to use their good offices in bringing about an understanding between China and Japan. Having earnestly urged this course on the Korean Government, he went on board his ship, where he waited ten days before taking his final departure in hopes of a favourable reply. It was all to no purpose, however, and Yoshitoshi reluctantly took his way back to Tsushima, whence he shortly afterwards proceeded to Kiôto to make his report to Hideyoshi. The latter was enraged at the indifference to his overtures shown by the Koreans, and was especially indignant at a passage in the reply which Yoshitoshi brought to the letter of Hideyoshi quoted above, in which his project of conquering China was compared to "measuring the ocean in a cockle-shell," or "a bee trying to sting a tortoise through its armour."

Digitized by Google

THE INVASION.

Chapter I.

The year 1591 was spent by both sides in warlike preparations. Korea had enjoyed peace for two hundred years, and her people responded unwillingly to the demands made upon them by the Government. The labour of fortifying castles was found so irksome, that this essential measure of defence was much neglected, and the organization of the militia had fallen into a lax condition which it was now too late to remedy. In former times, each district had its general muster under a competent commander, but this system had given way to a more localized one, by which the men were only required to assemble occasionally at the nearest town or village. It was found, moreover, that although the muster rolls exhibited an imposing force, the numbers that appeared in arms when summoned were miserably scanty. Weapons were not wanting, but there was one fatal deficiency—the Koreans had no fire arms, the only matchlock which had until then been seen in that country being one which had been presented to the king by Yoshitoshi, on the occasion of his recent embassy.

Japan entered on the war under far different auspices. The feudal system, so favourable to the growth of military virtues in a nation, was then flourishing in full vigor, and the long series of intestine conflicts which had just come to a close left Hideyoshi provided with an army of veterans inured to war, and accustomed to victory under his leadership. As the expedition was directed not so much against Korea as against China, it was deemed necessary to put forth the whole warlike strength of Japan in preparing for it. Each *Daimiô* in Kiushiu was ordered to furnish six hundred men for every ten thousand *kokus*

Digitized by Google

of his assessed revenue, and those of Shikoku and the main island smaller numbers in proportion to their distance from the port of embarkation. For every hundred thousand *kokus* of his revenue, every *Daimiô* whose domain bordered on the sea sent two large junks, and to man them every fishing village was compelled to provide ten sailors for every hundred houses which it contained. In this way a force was assembled at Karatsu, then called Nagoya, in the north of Kiushiu, which is variously estimated at from three hundred thousand to four hundred and eighty thousand men, inclusive of sailors and camp-followers. All were more or less disciplined, and a few thousands were armed with the matchlock, a weapon which had lately been introduced into Japan by the Portuguese, and which was destined to play an important part in this war. Hideyoshi at first intended to take the chief command in person, but he was dissuaded from doing so and contented himself with proceeding to Karatsu, near which town he had caused a pavilion to be built for his reception on the shore of a beautiful bay. The spot has ever since borne the name of *Kariya*, or, temporary residence.

According to the lowest estimate given by native authors, the number of men who actually crossed over to Korea was one hundred and thirty thousand, and a reinforcement of fifty thousand men was sent a few months later. The chief generals were Konishi Yukinaga and Katô Kiyomasa. Konishi's division was the first to reach Korea. He landed near Fusankai on the 13th day of the 4th month, 1592, and at once captured that town as well as the neighbouring castle of Torai or Tongné (東萊). On the arrival of the other ships of the expedition, Konishi and Katô advanced in a north-westerly direction along two roads leading to the capital, while the remaining generals followed by more circuitous routes or occupied the towns already taken. Konishi and Katô met with no serious obstacle in their advance. Castle after castle was deserted on their approach or surrendered after a feeble resistance, while such troops as could be induced to meet the Japanese in the field were dispersed without much

Digitized by Google

difficulty. One of the most important of Konishi's successes was the capture of a town called Shang-chiu (尙州) in the north-western corner of the province of Kiúng-shang-tô. Here a Korean named Ôshiun (應聲) was taken prisoner, who was acquainted with the Japanese language. This man was sent by Konishi to the Korean capital with a letter from Hideyoshi and a communication addressed to the Korean Minister in charge of foreign relations (the 禮曹), which was to the following effect. "The Governor of Urusan when "made prisoner at Tôrai was released and entrusted "with a letter to which no answer has been returned.* "If the Koreans wish for peace let them send Ri Tokukei, "to meet him at Tyūng-chiu (忠州) on the 28th." Ri Tokukei had previously filled the office of official entertainer of the Japanese embassy, which explains why his name was mentioned. He was willing to undertake the mission, and as matters were already in a desperate condition at the capital, and no one had any better plan to offer, it was resolved to comply with Konishi's suggestion. Ri Tokukei accordingly set out provided with a letter from the Foreign Minister and accompanied by the interpreter Ôshiun. On his way he heard of the capture of Tyūng-chiu, and sent forward Oshiun to inquire the truth of this rumour. The unfortunate interpreter fell into the hands of Katô's army, by whom he was executed as a spy. Ri Tokukei forthwith abandoned his mission, and returned to the Korean court.

Tyūng-chiu (忠州) was considered one of the strongest fortresses in the kingdom, and the news of its fall caused a general panic in the capital. The inhabitants fled in all directions, many even of the soldiery deserted their posts, and after some hesitation, the King himself resolved to take refuge with his court in the province bordering on China, and to send the royal princes to those

* The Governor had been afraid to present himself before his Government in the character of a released prisoner; he therefore said that he had escaped, and made no mention of the letter with which he had been charged.

Digitized by Google

parts of the country which were yet unoccupied by the enemy in the hope that their presence might stimulate the people to more vigorous resistance. The royal train set out from the capital on the 30th day of the 4th month, only seventeen days after the first Japanese had landed in the country. A Korean author has given a moving description of the miseries of the journey northwards. With a retinue, the scantiness of which told a melancholy tale of desertion in the hour of danger and misfortune, the King made his first day's march, followed, as he passed along, by the lamentations of the inhabitants, who complained that they were being abandoned to the mercy of the invaders. His household was mounted on farm horses, no food had been provided for the journey, and a drenching rain fell during the whole day. Wretched with fatigue and hunger, they reached their lodging at Kaishung (開城) late at night, lighted by the glare of a public building which had been set on fire by the king's orders to deprive the Japanese of materials for rafts with which to cross the river which flows to the south of that city. Food had been provided here for the King and his suite, but the kitchen was invaded by hungry guards and attendants, and barely enough was saved for the king's supper. His less fortunate household had no food until the following day, when they were allowed to share with some soldiers their rations of boiled rice. Riyen did not feel safe until he had reached the fortified town of Pingshang (平壤) on the northern bank of the Taitong-kiang (大同江) in the province of Pingan-tô. Here it was resolved to make some stay, and to await the progress of events.

Three days after the departure of the King, Konishi and Katô reached the capital, and they soon after set out northwards with their combined forces, meeting with little resistance until they arrived at the river Rinchinkiang (臨津江) where they found a Korean army drawn up to dispute the passage. No boats could be discovered and the advance of the Japanese was consequently checked for several days. At length a feigned retreat induced a body

Digitized by Google

of Koreans to cross the river, and these were so roughly handled by the Japanese that the whole army immediately took to flight.

The relations of Konishi and Katô had from the first been the reverse of harmonious, and they had not proceeded much further when their dissensions grew to such a height that a separation became necessary. The route which each should follow was decided by the time-honoured method of casting lots. To Katô fell the north-eastern province of Hankiung-tô which extends for three hundred miles along the Japan Sea. Katô traversed nearly the whole of this immense region, where, after much hard fighting, he captured two of the Princes of the Blood, and many other Koreans of rank. He finally settled with his troops in the fertile region which surrounds the inlet known to Europeans as Broughton Bay.

Konishi, to whose lot the province of Pingan-tô had fallen, pushed onward to the river Taitong-kiang where the Koreans had again assembled a force at Pingshang on its northern bank, and were prepared to make a last effort to stem the tide of invasion. Konishi arrived before Pingshang about the end of the 5th month. He was joined about this time by Kuroda and Yoshitoshi, the *Daimiô* of Tsushima, who had made their way northwards by a different route.

Here a third attempt was made to negotiate. A Japanese, unarmed and alone, appeared on the bank of the river, and planted on the gravelly strand a branch of a tree with paper hanging from it as a signal that he wished to communicate. He was observed from the opposite shore by some Korean officers, who had ascended a tower in order to reconnoitre the Japanese position, and a man was sent across in a boat to inquire what was his business. The Japanese produced a letter addressed to Ri Tokukei with which the Korean messenger returned. This letter asked for an interview at which to discuss conditions of peace, and a meeting was accordingly arranged between Ri Tokukei and Yoshitoshi. Genso, a priest who had been Yoshitoshi's colleague in his missions to Korea, was also present. The in-

Digitized by Google

terview took place on the river, the skiffs which contained the two negotiators being moored side by side in the middle of the stream. After the usual greetings had been exchanged, Genso opened the conference by saying that it was the refusal of the Koreans to allow a passage for the Japanese army into China which had brought on the present war, and that even now, if a single road were thrown open for this purpose, their kingdom might escape destruction. But the Korean negotiator knew that such a concession would be fatal to the hope which they entertained of speedy aid from China, and replied that the unprovoked invasion of his country was inconsistent with the peaceful professions of the Japanese, and that if they really wished to conclude peace, they must withdraw their forces before the negotiation could proceed further. A blustering speech from Yoshitoshi brought the interview to a close, and the two boats returned to their respective sides of the river.

Negotiation having proved a failure, and a vigorous resistance being evidently intended by the Koreans, Konishi desisted for the time from further endeavours, and employed his men in constructing for themselves huts.

Pingshang was sufficiently garrisoned, and was abundantly supplied with provisions. The inhabitants, who had fled on the first alarm of the enemy's approach, had been induced to return to their homes by the assurance that the city would be strenuously defended, and there seemed to be favorable hopes of a successful resistance. But no combination of circumstances could make up for the irresolution, disunion, and utter want of confidence which prevailed among all classes. On the 11th day of the 6th month the Japanese made a demonstration against the town, but as they had no boats, and were unacquainted with the fords of the river, nothing was effected and they were compelled to retire. On the same day, however, the King again set out northwards, this time continuing his flight until he reached Ichiu (義州), a fortified city close to the Chinese frontier. On his way he heard of the capture of Pingshang, a piece

Digitized by Google

of news which led to fresh desertions among his court, and the inhabitants of the towns through which he passed were instigated by the same intelligence to pillage the stores of rice which had been collected by the government for the use of the army.

The fall of Pingshang came about in the following way. The Korean generals having observed that the Japanese had greatly relaxed the vigilance of their watch, resolved to make a night attack on their camp. Their arrangements, however, were badly concerted, and it was almost dawn when the attacking force was assembled on the Japanese side of the river. The first onset was successful. Konishi was taken by surprise, and he sustained severe loss in men and horses, 300 or 400 of the latter being carried off by the Koreans. Kuroda's division, however, came to the rescue, and after a stubborn contest the Koreans were driven back to the river-bank, where they found that the boats which had brought them over were now moored in mid-stream, the men in charge of them not daring to approach the shore where their countrymen were so hard pressed by the enemy. Many were drowned, and although the bulk of the army recrossed by the fords, this had the disadvantage of betraying their position to the Japanese, who were not slow to make use of their information. They crossed the river on the same evening, and the city of Pingshang was at once abandoned by the garrison, disheartened by the failure of their enterprise of the previous night. Large quantities of arms had been flung by the Koreans into ponds within the city, but the stores of grain fell into the hands of the Japanese.

The Governor of Laotung, the province of China which borders on Korea, had been a close observer of the progress of the Japanese invasion. He at first thought it incredible that their army could have advanced so rapidly without the connivance of the Korean Government, and he was not satisfied until he had assured himself by sending a special agent to Pingshang that no treasonable understanding existed with the Japanese. The Chinese

Digitized by Google

Government were equally difficult to convince of the good faith of the Koreans, but after some hesitation they consented to send them a small body of men who were to act as a body guard to the King. This detachment had entered Korea, and were on their way to Pingshang, when they heard of its capture by the Japanese, upon which they promptly withdrew again to the frontier city of Ichiu. The Korean Government, however, became more urgent in their appeals. They even offered to become subject to China in return for aid against the Japanese, and the Chinese Government were at last induced to send to their assistance a force of 5,000 men raised in Laotung. This army arrived in Korea early in the 7th month, and marched to Pingshang, which they attacked on the 19th of that month. The Japanese allowed them to enter the city and to become entangled in its narrow lanes, and then attacked them from advantageous positions which they had occupied previously. The Chinese were defeated with great loss, their general being among the slain, and they were so utterly demoralized by this disaster that they could not be prevailed upon to desist from their retreat until they were safe back in their own province of Laotung.

About this time, an event took place in the south of Korea which was pregnant with results of the highest importance. The Japanese fleet was stationed at Konishi (巨 齊), a little to the west of Fusankai, where it had remained inactive since the opening of the campaign. Konishi now resolved to bring it round to the western coast, so as to co-operate with the army at Pingshiang. But the Koreans, who at first had sunk or destroyed their ships in despair of successfully resisting the Japanese by sea, afterwards plucked up courage and assembled a new fleet with which they appeared off the mouth of the narrow inlet where the Japanese navy was at anchor. By a feigned retreat they drew the Japanese after them to the open sea, and then, at a preconcerted signal, turned on their pursuers. In the engagement which followed, the superior artillery of the Koreans, together with a new kind of war-junk, in which the fighting men were protected

Digitized by Google

from the enemy's fire by screens of planking, ensured them a complete victory. The Japanese were compelled to retire to Fusankai and to abandon their plan of prosecuting the campaign in the north-west with the land and sea forces combined. It is probable that this decisive check not only restrained the further progress of the Japanese army in Korea, but preserved China itself from invasion. It also encouraged the Koreans in other parts of the kingdom to assume a bolder attitude. Troops were assembled round Pingshang, which, although unsuccessful in their attempts against that city, were able seriously to embarrass Konishi's movements, and the Korean armies in the centre and south of the country also took the offensive against the Japanese, if not with uniform success, yet without being invariably defeated as at the beginning of the war.

When the Chinese Government heard of the defeat of the Laotung troops at Pingshang, they set about preparing to send a second and larger army to the assistance of the Koreans, but as some months must elapse before it could be ready, they despatched an envoy to the Japanese general Konishi with proposals of peace. This envoy was a dissipated worthless fellow named Chin Ikei (沉惟敬) who had some knowledge of Japan and Japanese affairs gained from a man who had been carried off to that country by pirates, and detained there as a captive for many years. It is not clear what powers were conferred on him by his Government, nor whether there was any real intention of making peace with the Japanese. On the whole, it appears probable that Ikei's mission was nothing more than an expedient to gain time until the Chinese army should arrive in Korea. It was about the beginning of the 9th month when Ikei reached the head-quarters of the Korean army at Shun-an, a town a few miles to the north of Pingshang. He at once entered into communication with the Japanese, and arranged an interview with Konishi, Yoshitoshi, and Genso at a spot not far from that city. Ikei's courage in venturing among the Japanese with only three or four

Digitized by Google

attendants was greatly admired by the Koreans, and drew from Konishi what was doubtless meant as a high compliment. "Not even a Japanese," said he, "could have borne "himself more courageously in the midst of armed enemies." A Japanese guard escorted Ikei back to his Korean friends, who little expected to see him return alive. On this occasion an armistice was concluded of fifty days, during which Ikei promised to proceed to Peking, and to return to Pingshang having made arrangements for a peace satisfactory to both parties. The character of the proposed agreement may perhaps be gathered from a document delivered to Ikei by Konishi. It stated that the invasion of Korea was owing to the refusal of that country to send embassies to Japan in recognition of those despatched to Korea by the Japanese Government. "Ikei's mission," he continued, "offered a favourable opportunity of making "peace. Let him persuade his Government to send envoys "to Japan as a mark of their friendly wishes. He would "regard their coming with the highest satisfaction, and "wait for fifty days in expectation of their arrival." Ikei promised to bring an answer within the time agreed upon, but on his return to Peking, he found an army of forty thousand men ready to march. His authority to treat with the Japanese was questioned, and in short his negotiations came to an abrupt end. No intimation of their tenor, except as to the truce of fifty days, was ever made to the Korean Government.

During the remaining months of the Japanese year corresponding to A. D. 1592 little change took place in the position of either party. The advantages gained were on the whole with the Koreans. In many parts of the country volunteer troops were raised, who carried on a guerilla warfare which greatly harassed the Japanese, and prevented them from venturing far from the strongholds which they occupied along the principal roads leading from Fusankai to Pingshang. The Korean army near the last-named place rendered an important service by detecting and executing a number of the spies in the pay of the Japanese. Those who escaped were

Digitized by Google

deterred by the fate of their comrades from continuing so dangerous an occupation, and the Japanese were consequently without intelligence of the approach of the formidable army which China was now sending against them.

The Commander-in-Chief of this army was named Ri Joshô (李如松). He appears from the Korean history of the war to have been a bully, a braggart and, above all, a thorough coward. Reaching Shunan (順安) with his army towards the end of the 12th month, and finding that the Japanese were still unaware of the danger which menaced them, he thought this a favourable opportunity for trying what could be done by treachery before openly commencing warlike operations. An intimation was conveyed to Konishi that Ikei had arrived, and that he wished to continue the negotiations of some months before. The news was received by the Japanese on the 1st day of the new year. They regarded this circumstance as a favourable omen, and were greatly delighted at the renewed prospect of peace. Konishi sent a guard of twenty or thirty men to meet Ikei and escort him to the Japanese head-quarters, but they fell into an ambush which had been laid for them by the Chinese commander, and all were killed except two or three, who brought back to Konishi the first intelligence of the arrival of a Chinese army.*

(To be continued.)

---

* The writer hopes to be allowed to complete this sketch of the Invasion of Korea on a future occasion.

Digitized by Google

Digitized by Google

ASIATIC SOCIETY OF JAPAN.

A general meeting was held at the Grand Hotel, Yokohama, on Saturday, the 9th March, the Chair being occupied by the President.

The minutes of the previous meeting having been taken as read, the name of Mr. Edward Fischer was announced as a new member.

In the absence of Mr. Satow his note on the use of the "Fire-drill" was read by the Recording Secretary.

The President observed that we are informed by Tylor that the mode of kindling fire described in Mr. Satow's paper, and to which Tylor gives the name of "Fire-drill," has been found among many primitive tribes in Tasmania, Australia, Sumatra, the Carolines, and as far north as Kamchatka. It is curious to learn that the same custom was at one time followed in Japan, and that the Japanese continue even now to observe it on certain religious occasions, as a means probably of preserving a record of this ancient practice. Foreigners in Japan and China will be familiar with the "pump-drill" mentioned in the paper, as it is in common use at this day in mending broken china.

Mr. Aston then read a paper on "Hideyoshi's Invasion of Korea."

The President remarked that much interest attached to Mr. Aston's paper as it throws light on an important passage in the history of Japan and her early relations with Korea and China. Few Japanese appear to approve of Hideyoshi's invasion, and a native writer in high position has recently described it as an enterprise prompted by vanity, and as a rude incursion into a peaceful land which produced no good result either in Japan or Korea. Hideyoshi had evidently no cause of quarrel with Korea; but, in order to attack China, which appears to have been the great object of his ambition after the conclusion of the wars at home, he did not scruple to sacrifice a weaker power. But notwithstanding the military feebleness of the Koreans, the expedition, though undertaken with a force of 130,000 men which was afterwards largely augmented, did not penetrate beyond Ping-shang (P'ing-jang in Chinese) and therefore never reached Chinese territory. In the end it had to retire from Korea after a protracted and an unsuccessful struggle of six years. The insight into Hideyoshi's character which the paper affords is very interesting; he appears to have had all the faults of a man of low origin intoxicated by the

Digitized by Google

great triumphs which he had won by his sword over the feudatory chiefs of his own country; in his communication with Korea he did not hesitateto assume Imperial designations, and he seems to have plunged his country into this bloody and unnecessary foreign war without consulting his nominal sovereign. We can also perceive from the paper the importance which these several nations—Japan, China and Korea—attached to the embassies they sent to each other, the difficulties under which they were conducted, and the delicate questions which continually arose as to titles and forms. In later days we have seen how greatly similar questions affect existing relations between the same countries. Thus the recent Treaty between Japan and Korea is made in the name of the Governments of those countries and not in that of their respective Sovereigns, because the contracting parties could not agree as to the titles by which the Sovereigns should be designated. Korea seems to have been long inconvenienced by her situation between two superior powers: she could not satisfy one without offending the other. Profiting, however, by the experience gained in their intercourse with Western States the Japanese Government have lately initiated a better system of dealing with Korea, and her present relations with that country give promise of much greater advantage to both than did those of the past which had never been really friendly since the time of Hideyoshi's invasion.

The President thanked Mr. Aston for his valuable paper, and assured him that the Society would look forward with pleasure to the continuation of the subject which he had been so good as to promise them.

Digitized by Google

DESTRUCTIVE EARTHQUAKES IN JAPAN.

BY

I. HATTORI, Esq.

Read before the Asiatic Society of Japan, on the 23rd March, 1878.

It seems very strange that in Japan, which is subjected to very frequent earthquakes, so little notice has been taken of the subject. In China the subject was well studied at an early period, and a seismograph, perhaps the first ever made in the world, was invented by Choko in the 1st year of Yoka (132 A.D.).

In the Life of Choko in Gokwanjo (History of Kwan) we find the following description. "The seismograph "consisted of a copper vessel, whose diameter was 8 *shaku* "or feet, and whose convex-cover was ornamented with "characters, mountain-turtles, birds and beasts. In this "vessel there was one main piston in the middle with its "eight branches, wires and springs. On the outside of "this vessel there were eight dragon heads, each of them "having a copper ball in its full-opened mouth. Under "each of the dragon heads there was a frog looking up-"wards with its mouth fully opened. The wire works and "springs were very skillfully arranged in the vessel, but "the cover was very closely fitted, and they could not be "seen. Whenever the earth shook, one of the dragons "dropped the ball, the frog underneath received it in its

Digitized by Google

"mouth, and produced a sound. By this means the "direction of the shocks was ascertained. Once one "of the dragons dropped its ball, but no person near "it perceived any shock, and all learned men of the capi- "tal doubted the trustworthiness of the machine; but "after a few days a mail arrived from Rosei and reported "the occurrence of an earthquake there." This remarkable event made the machine known all over the country, and the Government appointed an officer to record all earthquakes as indicated by it.

Again Rinkotei of Zui (7th century) wrote a book on the seismograph, but both Choko's seismograph and Rinkotei's book passed from existence long ago, and we have no means of finding out what were the secret arrangements of the wires and springs above mentioned.

In Japan there may be said to be three different beliefs or superstitions about earthquakes.

I. According to the Chinese Philosophy, in the summer and spring 'In' or the negative principle rises from the earth, and in the autumn and winter 'Yo' or the positive principle. If one of the principles rising from the earth is resisted by the other in the atmosphere, and their free circulation is interrupted, then there is an earthquake.

II. Buddhists divide earthquakes into four classes: first the shock of *Kwa* or fire, second of the *Kinshicho* or golden winged birds, third of the *Riô* or dragon, and fourth of *Tennô* (heavenly master?). A priest called Tensho says in his work "Jishin Setsu" (An opinion about earthquakes), that the movements of twenty-eight constellations and their relative positions with respect to the moon cause earthquakes; so he asserts by careful calculations all future earthquakes can be predicted.

III.—A monstrous cat-fish lives underneath the Empire of Japan, and whenever this fish moves there is an earthquake, so Kashima-miojin or Takemikazuchi-no-mikoto keeps it quiet if possible with the Rock of Kaname. The origin of this superstition is not known, but no doubt it has undergone several changes or modifications since it was first originated. The Jishinkô (Thoughts on earthquakes)

Digitized by Google

gives a fac-simile of a representation of the *Jishin mushi* or the earthquake insect which was found on the title page of an almanac of the 9th year Kenkiu (1168). Here instead of a cat-fish is a strange looking creature having on its back a map of the Empire of Japan. Its body is oblong, with many scales, its feet look like those of a spider and are ten in number, its head resembles a dragon's as represented in many pictures, and by the head there is a sword, which is marked as the Rock of Kaname, and the following verse is found near the sword:—

Yuruyu tomo,
Yomoya nukeji no
Kaname Ishi,
Kashimano kamino
Aran kagiri wa.

Or in English,

No monster can move the Kaname Rock,
Though he tug at it never so hard,
For over it stands, resisting the shock,
The Kashima kami on guard.

The verse is well known even now among the people as an earthquake verse.

The reason why the sword is placed here is this:—The Japanese mythology says that, by the order of Takami-musubi-no-mikoto, two gods Takemikazuchi-no-mikoto (Kashima-miojin) and Futsunushi-no-mikoto (Katori-miojin) having conquered Ashiwara Nakatsukuni, then came down to the coast of Isodasa in Idzumo, and planted a sword into the ground; and the stone post of Kashima or Kaname Rock has been placed in memory of the mythological event. How and when the earthquake insect in the superstition of the 12th century changed into the cat-fish of today cannot be traced, but at any rate the belief in the fish already existed at the first part of the last century. We find it mentioned in the Tenchiwaku Monchin (Curious questions about the Heaven and Earth, 1709), and its author suggests as a probable origin of the superstition, that when Jimmu Tenno travelled into different parts of the country, he thought its general shape was like a dragon-fly, and gave to it the name Akitsu Shima, or Island of the Dragon-fly, and probably then

Digitized by Google

caused a map of it to be made. This map of the first Emperor was so roughly drawn, as might have been expected, that the people took it for a fish instead of a dragon-fly, because probably it was as like the latter as anything else. So every time there was an earthquake they thought it must be caused by the fish which carried the Empire.

Turning now to the history proper of earthquakes, we find it impossible to obtain any reliable information concerning shocks which occurred in Japan earlier than the first part of the 5th century. This is not because earthquakes did not affect Japan previous to this, but because the Chinese characters in which the records were kept were first introduced into the country at the last part of the 3rd century, and did not come into general use for some time afterwards. In the works Odai Ichiran (Glance at the Imperial Dynasties, 1652) and Houchô Nendaiki (Chronicle of Japan, 1684) it is mentioned indeed that Fujisan and lake Biwa were produced by an earthquake in a night in the 5th year of Kôrei Tennô (286 B.C.), but no mention is made of it in any older book of good authority, and the statement must therefore be regarded as unfounded.

From different Japanese works, a list of which will be found at the end of this paper, and from information kindly furnished by several reliable persons, I have compiled the following account of what may be termed destructive earthquakes. It would have been easy to swell the list to a much greater extent by admitting those of inferior severity. Nothing is more difficult than to make a classification of phenomena of this description. If the destruction of human life or of property be taken as the criterion, it is easy to see that a shock comparatively feeble may produce a much greater destructive effect, if occurring in a populous district, than in a sparsely populated region. The absence of records, also, in some districts, and the minute and systematic records in other places, are liable to give a false impression in regard to the distribution of earthquakes. It is probably owing to this

Digitized by Google

cause that Kiôto and Yedo have borne an unenviable reputation for the frequency of earthquake shocks Using my best judgment in regard to the recorded shocks and having consulted every important available record, I submit the following list arranged chronologically.

In the 5th year of Inkiô Tennô (416 A.D.) a great earthquake took place on the 14th day 7th month, and the Imperial Palace was thrown down.—*Honchô Nendaiki* and *Nihon Shoki.*

On the 27th day 4th month 7th year of Suiko Tennô (599), a severe shock destroyed all the buildings of Yamato, and prayer was ordered to be offered to the god of earthquakes in all parts of the empire.—*Nihon Shoki.*

In the 1st year of Kokioku Tennô (642) Yamato was visited on the 8th day 10th month by a severe shock accompanied by heavy rain, and the trembling of the earth lasted till the 14th day.—*Nihon Shoki.*

One took place at Yamato on the 11th month 4th year of Temmu Tennô (676), and another on the 14th day 6th month 6th year of the same Tennô (678).—*Ibid.*

A tremendous earthquake took place at Tsukushi (Chikuzen and Chikugo) on the 12th month 7th year of Temmu Tennô (679), and caused many fissures and chasms, of which the largest was 23,000 *shaku* or more than four miles in length, and twenty *shaku* in width. A farmer's hut on a hill was carried to a new place by the motion, in such a manner that the dweller was not aware of the fact till the next morning.—*Ibid.*

In the 11th year of Temmu Tennô (683) a shock was felt at Yamato on the 12th day 8th month.—*Ruiju Koku-shi.*

An earthquake took place on the 14th day 10th month 13th year of Temmu Tennô (685), and innumerable lives were lost in many provinces. Shikoku suffered most, the hot spring of the province of Iyo ceased to flow, and on the sea coast of Tosa a tract of land about 500,000 *chô* or nearly 2,000 acres in area sank down permanently.—*Nihon Shoki.*

In the 14th year of Temmu Tennô (68) a shock was

Digitized by Google

felt at Yamato on the 10th day 12th month, and another on the 24th day 3rd month 1st year of Taikô (701) at Tamba.—*Jishin Nendaiki.*

In the 1st year of Reiki (715) Tôtômi was visited by a severe earthquake. By the enormous masses of earth detached from the hills the course of the Aratama river was interrupted, and three counties Fuchi, Chôge, and Ishida were converted into a temporary lake.—*Zoku Nihonki* quoted in *Jishin Nendaiki.*

A shock was felt on the 7th day 4th month 6th year of Tempei (729). In many places streams were dammed up by land-slips, and fissures were formed.—*Jishin Nendaiki.*

On the 5th month 16th year of Tempei (744) an earthquake accompanied by heavy rain took place at Higo and caused land-slides at 280 places. The counties Amakusa, Yatsushiro, and Ashinokita were flooded, and 1,500 lives were lost.—*Zoku Nihonki* quoted in *Jishin Nendaiki.*

A violent shock was felt at Mino on the 4th month 17th year of Tempei (745), and caused a great destruction of life and property, and the trembling of the earth did not cease for a month.—*Zoku Niphonki* quoted in *Jishin Nendaiki.*

On the 9th day 5th month 6th year of Tempei-Hôji (762) a severe earthquake took place at Mino, Hida, and Shinano.—*Jishin Nendaiki.*

One was felt at Kiôto on the 14th day 8th month 16th year of Enreki (797) and shook down many buildings, and another took place on the 5th month 2nd year of Taido (807).—*Ruijiu Koku shi.*

On the 7th month 9th year of Kojiu (819) Sagami, Musashi, Shimosa, Hitachi, Kôdzuke, and Shimôdzuke were visited by a violent shock, and mountains were rent asunder in several places, and innumerable lives were lost. These provinces were relieved from the land tax of the year.—*Ibid.*

In the 4th year of Tenchô (827) a shock was felt at Kiôto on the 12th day 7th month, and many buildings were thrown down. On the same day besides the severe shock, there were three less severe, and from the 14th till

Digitized by Google

the end of the month there were shocks almost every hour. Succeeding these, shocks occured fourteen times during the next month, and four, five, four, and four times respectively in the remaining months of the year.—*Ibid.*

The subterranean disturbance at first begun in 827 did not cease without further great damages to the country. A severe shock was felt at Kiôto, on the 23rd day 10th month of the next year another in the 3rd month of the following year, and finally on the 3rd day 1st month 7th year of Tenchô (829) a terrific convulsion took place at Dewa, and overturned the castle of Akita. Deep fissures and chasms were formed in every direction, and the Akita river was dried up. From that day till the 28th of the month there were on an average four shocks in an hour.—*Ruijiu Kokushi.*

Kiôto was visited by a violent shock on the 24th day 2nd month 10th year Tenchô (833), and again on the 20th day 5th month 3rd year of Shiowa (836).—*Ibid.*

On the 11th day 2nd month 8th year of Shiowa (841) ninety-four successive and severe shocks visited Shinano and caused great destruction. In the same year another was felt at Idzu.—*Jishin Nendaiki.*

The province of Dewa was shaken violently on the 10th month 3rd year of Kashô (850), the earth opening in many places, and large masses became detached from the mountains destroying many lives.

Buntoku Jitsuroku quoted in *Jishin Nendaiki.*

An earthquake took place on the 5th day 5th month 2nd year Saikô (855), and the head of the famous Daibutsu of Nara was thrown down, and another shook violently the city of Kiôto in the 3rd month of the following year.—*Ibid.*

On the 17th day 6th month 5th year of Jiôgan (863) Yechigo and Yetchiu felt a tremendous shock, by which mountains were shattered overwhelming many people.

The ground was traversed by numerous cracks which belched forth great quantities of water.—*Sandai Jitsuroku.*

One was felt at Kiôto on the 12th day 10th month 6th year of Jiogan (864).

Digitized by Google

On the 8th day 7th month 10th year Jiôgan (868) Kiôto and its vicinity were violently shaken and many buildings were destroyed.

The next great earthquake in record took place in the province of Mutsu on the 26th day 5th month 11th year of Jiôgan (869). The sky was illuminated, and the movement of the ground was so violent that the people could nôt stand up, and many of them were crushed by falling houses, and others were swallowed up in fissures. Soon afterward the sea rolled in upon the coast with a tremendous noise and washed away thousands of the people.—*Sandai Jitsuroku.*

Kiôto was visited by severe shocks on the 14th day 4th month 15th year of Jiôgan (873), the 29th day 12th month of the following year (874), the 11th day 3rd month 19th year Jiôgan (876), and the 17th day 10th month 1st year Genkei (877).—*Jishin Nendaiki.*

A violent earthquake was felt in many provinces on the 29th day 9th month 2nd year of Genkei (878). In the provinces of Sagami and Musashi it was felt worse, and no house was left without injury.—*Jishin Nendaiki.*

One was felt at Kiôto on the 22nd day 3rd month 3rd year Genkei (880), and another on the 2nd day 4th month 4th year Genkei (881).—*Ibid.*

In the same year the province of Idzumo was violently shaken on the 4th day 10th month, and all buildings were thrown down. In the 12th month several severe shocks were felt at Kiôto and caused great damage to the city. The earth did not become entirely quiet until the end of the following year (882).—*Ibid.*

One which took place at Kiôto on the 14th day 4th month 1st year Jinwa (885) was accompanied by heavy rain, and on the 20th day 12th month a noise like that of falling houses was heard in the sky at Kiôto, which was soon followed by a severe shock.—*Sandai Jitsuroku.*

In the 2nd year Genwa (886) one was felt at Kiôto on 15th day 16th month.—*Ibid.*

On the 30th day 7th month 3rd year of Jinwa (887) a severe shock was felt throughout the country, throwing

Digitized by Google

down houses and causing great sea waves, by which innumerable lives were lost. The province of Setsu suffered most severely by the waves. In the province of Shinano the courses of the great rivers were dammed up by land-slides, and several counties were converted into a temporary lake.—*Ruiju Kokushi.*

An earthquake accompanied by an underground noise was felt at Kiôto on the 24th day 7th month 2nd year Yengi (901), and another on the 24th day 5th month 4th year Shôhei (934). *Jishin Nendaiki*

Kiôto was shaken severely on the 15th day 4th month 1st year Tenkei (938), and several buildings were overturned, and again on the 3rd day 6th month, this time heavy rain accompanying the shock. *Ibid.*

One was felt at Kiôto on the 21st day 9th month 2nd year Kôhô (965); another on the 3rd day 8th month 1st year Anwa (968); and still another on the 14th day 2nd month 3rd year Tenroku (972). *Honchô Nendaiki.*

On the 18th day 6th month 1st year Teigen (976) a terrific shock visited Kiôto and its vicinity, shaking down many buildings, including the Imperial Palace, the temples Toji Saiji and Seisuiji. In the last named temple alone fifty priests were crushed. In the province of Ômi the trembling of the ground lasted till the 23rd day of the following month.—*Jishin Nendaiki.*

Kiôto was visited by severe earthquakes on the 4th day 2nd month 2nd year Teigen (977); the 8th day 11th month 2nd year Eikan (984); the 6th day 11th month 4th year Chowa (1015) *Nihon Kiriaku;* the 11th day 3rd month 1st year Manji (1021); the 2nd day 3rd month 4th year Manji (1024); the 5th day 3rd month 5th year Chôgen (1032); the 8th day 9th month 1st year Chôkin (1040); the 2nd day 7th month following year (1041); the 18th day 6th month 3rd year Kôhei (1058); the 6th day 5th month following year (1059); and the 7th day 5th month 1st year Chireki (1065). *Jishin Nendaiki.* No particulars are given.

An earthquake took place at Kiôto on the 20th day

Digitized by Google

10th month 2nd year Yenkin (1069) and threw down many buildings. *Jishin Nendaiki.*

On the 7th day 8th month 5th year Kanji (1091) Yamashiro and Yamato were violently shaken and several temples were overturned.

Kiôto felt severe shocks on the 21st day 11th month 2nd year Yeichô (1096).

On the 8th day 7th month 1st year Bunji (1185) violent shocks were felt at Kiôto. The ground undulated like sea waves, shaking down the temples Tokuchô-juin, Rengiô-in, and Saishoko-in. This is the only recorded destructive earthquake of the twelfth century.—*Hôjôki* and *Heike-monogatari.*

One was felt at Kamakura on the 21st day 5th month 1st year Kempô (1213) causing great destruction.

One occured at Kiôto on the 6th day 9th month 3rd year Kempô (1215).—*Jishin Nendaiki.*

Kiôto was shaken violently on the 7th day 2nd month 2nd year Jinji (1240); and on the 19th day 5th month 6th year Kenchô (1254).—*Ibid.*

On the 23rd day 8th month 1st year Shôka (1257) a great earthquake took place at Kamakura overturning all houses. In many places mountains were violently rent, and innumerable fissures were formed, from which a bluish flame issued.

On the 13th day 4th month 1st year Eijin (1293) Kamakura and several other places were visited by a violent shock, the temples Jufukuji, Engakuji, and Daihiji being destroyed, and 21,024 persons perished in the catastrophe.

One occurred on the 25th day 4th month 1st year Shôan (1299) overturning the pagodas of Shitennoji of Ôsaka and Nanzenji of Kiôto. The number which perished in this earthquake is estimated at 10,000.—*Honchô Nendaiki.*

One which took place on the 1st month 1st year Bumpô (1324) shook down the pagoda of Tôji of Kiôto.—*Jishin Nendaiki.*

One occurred in 11th month 1st year Seichu (1324)

Digitized by Google

and a part of Chikubushima in the lake Biwa sank down. —*Honchô Nendaiki.*

On the 3rd day 7th month 1st year Genkô (1331) a shock took place, and a beach about twenty cho in length was permanently upraised at Chisato-no-hama in Kishiu. Four days afterwards another violent earthquake occurred, and the summit of Fuji-san fell in, losing over 100 feet of its height.—*Taiheiki.*

Kiôto was violently shaken on the 27th day 8th month 1st year Kembu (1332); the 19th day 7th month 1st year Rekiou (1338); the 19th day 2nd month 2nd year Kwanwo (1340); and the 20th day 6th month 1st year Kôan (1352).—*Jishin Nendaiki.*

Several severe shocks took place in the 6th month 5th year Yenbun (1360), causing great sea waves which rushed in upon Awajishima and overwhelmed all the inhabitants.

In the 9th year Ôyei (1402) a comet appeared in the spring, a great famine occurred in the summer, a typhoon in the fall, and great earthquake in the winter.—*Honchô Nendaiki.*

In the 10th month 26th year Ôyei (1417) Kwantô was violently shaken.

One was felt at Kiôto in the 3rd month 30th year Ôyei (1419).—*Jishin Nendaiki.*

On the 16th day 9th month 4th year Yeikio (1432) one was felt at Kiôto and land-slips occurred in many places.—*Honchô Nendaiki.*

In the 5th year Yeikiô (1433) a violent shock occurred at Kamakura causing many land-slides.—*Jishin Nendaiki.*

On the 8th day 9th month 12th year Yeikiô (1440) one was felt at Kiôto.

On the 10th day 4th month 1st year Hotoku (1449). Kiôto felt a severe shock which rent Yawata-yama, and threw down many buildings.—*Jishin Nendaiki.*

Kiôto was visited by severe shocks on the 30th day 12th month 1st year Kashô (1455); in the 2nd month 1st year Kwansei (1460), on the 29th day 12th month 1st year Bunsei (1466); in the 10th month 2nd year Meiô (1493);

Digitized by Google

and on the 7th day 5th month the following year (1494). —*Jishin Nendaiki.*

On the 15th day 8th month 4th year Meiô (1495) one occurred at Kamakura, and the Daibutsu was injured.—*Ibid.*

On the 19th day 8th month 7th year Meiô (1497) a severe earthquake occurred, and the coasts of Isé, Kii, and Mikawa were devastated by great sea waves.—*Ibid.*

One was felt on the 7th day 8th month 7th year Yeishô (1510), and many people perished in the provinces surrounding Kiôto.—*Honchô Nendaiki.*

On the following day another severe shock was felt, and on the 28th a considerable area of land in the province of Tôtômi sunk down, and the place is now known as the ferry of Imagire.—*Jishin Nendaiki.*

Kiôto was shaken severely in the 6th month 9th year Yeishô (1512); on the 8th day 4th month 11th year Yeishô (1514); in the 2nd month 2nd year Kôji (1556); and on the 19th day 11th month 13th year Tenshô (1583).—*Ibid.*

The provinces of Suruga and Tôtômi felt a severe shock in the 2nd month 17th year Tenshô (1589), and many houses were thrown down.—*Ibid.*

On the 12th day 7th month 1st year Keichô (1596), a great earthquake took place shaking down the castle of Fushimi, and many houses of Kiôto, under which a great number of the inhabitants were buried. The falling down of the Daibutsu of Kiôto in the earthquake is the subject of an anecdote. Taikô Hideyoshi after the earthquake set out to Kiôto from Fushimi, taking with him Tokugawa Iyeyasu, to see what had been the fate of the Imperial Palace. On his way he passed by Hôkôji, and when he saw the Daibutsu in ruins his face was flushed with anger, and he said scornfully: "I placed you here at an immense expense, with no other purpose than that you might watch over and help the people; but you can not even help yourself." And with that he shot an arrow at the broken idol. It is also said that many maids of Hideyoshi were buried under the

Digitized by Google

falling buildings of Fushimi, and the vacancies so caused were filled with courtesans from Ôsaka.—*Toyotomifu* and *Nihon-guaishi.*

Mr. Nagamatsu of the Daijokwan has kindly furnished me with an extract from a French work, which is now in the course of translation into Japanese. It says that in 1586 (1596?) there was a great earthquake in Japan, and the trembling of the earth did not cease at Kiôto for forty days. In Sakai sixty houses, and in Nagahama about one thousand houses were shaken down. At Kiôto the famous Daibutsu and many houses were destroyed, and great sea waves rolled in upon the sea coast of Wakasa, and washed away a commercial town. Landslides from the hill upon which the castle of Ôgaki of Mino was situated filled up a neighbouring swamp, and in many parts of the country there were formed new ponds of such size that a musket ball could not pass over.

On the 25th day 10th month 19th year Keichô (1614) an earthquake was felt at Kiôto.—*Koku-Riôki.*

One was felt on the 11th day 1st month 4th year Kanyei (1627).—*Honchô Nendaiki.*

On the 20th day 1st month 10th year Kanyei (1633) Odawara was violently shaken and many lives were lost. —*Taihei Nenpiô.*

Yedo was visited by a great earthquake on the 13th day 5th month 4th year Shôhô (1645), and many houses of Daimiôs were injured.—*Ibid.*

An earthquake occurred on the 22nd day 4th month 1st year Keian (1648), and land-slides took place at Hakone.—*Jishin Nendaiki.*

On the 5th day 2nd month 2nd year Keian (1649.) The province of Iyô felt a severe shock, and the castle was greatly injured.—*Taihei Nenpiô.*

On the 20th day 6th month of the same year a shock was felt at Yedo shaking down many houses, and causing the death of numerous inhabitants.—*Ibid.*

One was felt severely in many provinces surrounding

Digitized by Google

Yedo on the 23rd day 3rd month 3rd year Keian (1651). —*Ibin.*

On the 1st day 5th month 2nd year Kwanbun (1662), a severe shock took place in the province of Ômi, causing landslides at Kuchigi Tani, which overwhelmed many houses and inhabitants.—*Ibid.*

In the 11th month of the same year one was felt at Ôsumi and a new beach was raised.—*Jishin Nendaiki.*

Matsumaye was violently shaken on the 25th day 7th month 3rd year Kanbun (1663).—*Taihei Nenpiô.*

On the 6th day 12th month of the same year Kiôto felt a severe shock, the castle of Nijo and other public buildings were damaged.—*Ibid.*

On the 27th day 12th month of the following year Takata in Yechigo felt a severe shock, and many people perished.—*Ibid.*

On the 22nd day 5th month 3rd year Tenwa (1683) a severe shock took place at Nikkô causing great damage to the temples.—*Honcho Nendaiki.*

On the 22nd day 11th month 11th year Genroku (1703) a violent convulsion took place causing many land-slides at Hakone, and destroying the town of Odawara. In Yedo several houses of Daimiôs were overturned.—*Taihei Nenpiô.*

The famous scholar Arai Hakuseki was then living at Yushima, Yedo, and in his autobiography we find the following passage. "A little after midnight I was awak-"ened by a sudden convulsion of the earth, and snatching "my swords I rushed out. All the papered partitions and "doors fell down, and my wife and children were already "out of doors. As the back of my house was near a high "precipice I took my family to the front of the house for "safety, and lest the earth should open at any time I brought "out several doors, and made my family sit on them. I "then made preparations to go to my prince's house, "taking with me three servants, and bidding the other to "stay with my family. In order to fetch a small medi-"cine box I went into the house, which was rocking to "and fro like a vessel on waves, and I was so confused

Digitized by Google

"that while I took a new dress out, I forgot all about the "box and ran out. When I was passing by the eastern "gate of Kanda Miôjin, another convulsion took place. "All houses thereabout were thrown down, and many "people were huddled together in the middle of the "streets. I saw a light in a house, and I thought unless "it were put out, soon a great fire would occur. On the "northern side of Shôhei Bashi I met Asakura Yôzô who "was just coming to my house; so asking him to take "care of my family I crossed the bridge and ran toward "the south. On turning to the west, and then to the "south, I saw by the moonlight Fujiye Wakasa-no-kami "on horse back hesitating to proceed, because a "fissure in front of him was sending forth a stream of "water. "Follow me my men" said I to my servants, "and they all crossed the stream with me. By getting "wet my straw shoes became very heavy, so I put on "a new pair and rushed toward Kanda-Bashi. By this "time another severe shock occurred, and noises like "multitudes of mosquitoes and the cracking of bamboos "were heard. It must have been the noise caused by "falling houses and the cry of helpless women and child-"ren. The stone walls of the castle were thrown down, "and dust filled the air."

Kiôto felt a severe shock on the 15th day 9th month 3rd year Hôyei (1706).

On the 4th day 10th month 4th year Hôyei (1707) the weather was hot and calm. Suddenly a terrific earthquake occurred in the provinces along the Tôkaidô, causing many fissures and chasms. Along the coasts of Shikoku and the Tôkaidô great sea waves rolled in and swept away multitudes of people. Tôtômi, Kii, Setsu, Tosa, Iyo, and Idzu suffered most, and on the 11th month a frightful eruption of Fuji-san occurred, and a new peak on the side of the mountain now called Hôyei-san was produced.—*Kokuriôki, Taihei-nenpiô, Buko-nenpiô.*

In memoranda kept by Mr. Miyazaki, who was an assistant to Mr. Ino, a well-known surveyor in the first part of this century, we learn that by the earthquake of

Digitized by Google

1707 the eastern coast of the Empire was elevated while the western coast subsided.—*Sansai-raku.*

On the 20th day 11th month 8th year Kioho (1723) a severe shock was felt at Kiushiu.—*Taikei-nenpiô.*

Nagasaki was shaken violently on the 25th day 9th month 10th year Kiôhô (1725),—*Ibid.*

On the 29th day 2nd month 1st year Hôreki (1751) a shock was felt at Kiôto shaking down many buildings.—*Jishin Nendaiki.*

Yechigo was visited by a great earthquake on the 25th day 4th month of the same year, mountains were rent in many places, and 16,300 lives were lost. A place called Kami Nadachi was also destroyed in this earthquake, and the following account is found in the book called Toyuki. "Thirty-five years ago (1751) a mountain on the back of "Kami Nadachi having been rent into two, sunk down to "the bottom of the sea taking with it the whole town. "To this day nothing grows on the side of the rent, and "it looks like a white wall. The inhabitants of Shimo "Nadachi relate the following story :—The night of the "great earthquake was very calm and clear, and the in- "habitants of Kami Nadachi went out catching the fish "*tara* and *karei*. As these fish were caught better at "some distance from the shore, most of the people had "gone out eight or nine miles. Looking back to the shore "they beheld the sky in the direction of Kami Nadachi "illuminated. They naturally thought the place had "caught fire, and hastily went back, but nothing had "happened on the shore while they were away. It was "not long before a terrific sound like a discharge of a "large cannon was heard underground, and suddenly the "whole town except one woman sank down to the bottom "of the sea. This woman was found clinging to a tree "which was floating on the water."

On the 30th day 7th month 6th year Horeki (1757) an earthquake was felt in Ômi.—*Taihei Nenpiô.*

A severe shock took place in Ôshiu on the 28th day 1st month 3rd year Meiwa (1665).

Digitized by Google

One was felt at Yedo on the 2nd day 6th month 8th year Meiwa (1771).—*Taihei Nenpiô.*

On the 15th day 7th month 2nd year Temmei (1782) a violent shock was felt at Yedo destroying many buildings. At this time Odawara suffered most, and and the castle was greatly injured.—*Taihei Nenpio.*

Yedo felt a severe shock on the 2nd day 2nd mouth 3rd year Temmei (1783).

At Hizen an eruption of Unsengadake took place accompanied by very severe shocks on the 2nd month 4th year Kansei (1792).

On the 15th day 11th month 3rd year Kiôwa (1803) Sado was visited by a severe shock.

In the 1st year Bunkwa (1804) the province of Dewa was shaken violently and Hisagata-yama subsided.—*Jishin Nendaiki.*

From the 21st to 24th day 2nd month 6th year Bunkwa (1810) Atsumi of Shinshiu felt severe shocks, and on the 24th a tract of land about 5,400 feet in length and 3000 feet in width subsided, but no life was lost.—*Taihei Nenpiô.*

On new year's day of the 7th year Bunkwa (1811) several violent shocks were felt at Sado.—*Ibid.*

Yedo and its vicinity were shaken violently on the 4th day 11th month 9th year Bunkwa (1813), and at Kanagawa and Hodogaya many houses were overturned.—*Ibid.*

The provinces surrounding Kiôto felt a severe shock on the 12th day 6th month 2nd year Bunsei (1819).

In the province of Ôshiu and Yezo 150 severe shocks were felt in the 1st month 5th year Bunkwa (1822).

On the 12th day 11th month 11th year Bunsei (1828) Yechigo experienced a violent shock which caused great destruction to Nagaoka and Sanjô.—*Shin Rai Kosetsu.*

On the 2nd day 7th month 1st year Tempô (1830) a violent convulsion occurred at Kiôto shaking down the castle of Nijô and many important buildings. The trembling lasted till the end of the 8th month.—*Jishin Ko.*

On the 24th day 3rd month 4th year Kôka (1847)

Digitized by Google

a terrific earthquake took place at Shinano causing fissures and land-slides. Matsushiro, Uyeda, Iiyama, and Zenkôji suffered most. At Zenkôji it happened to be a festival day, and thousands of peoble had assembled there from different parts of the country when the severe shock occurred, and a great many lives were lost. At several places enormous masses from the hills were thrown down into the course of the rivers, so as to give rise to a lake. In the place called Nakano alone out of 6,872 houses and 29,215 inhabitants, 2,115 honses were thrown down, 578 persons killed and 1,460 wounded.—*Chidôko and Chisai-saiyô.*

On the 2nd day 2nd month 6th year Kayei (1853) a severe earthquake was felt at Odawara.

On the 4th day 11th month 1st year Ansei (1854) the provinces of Suruga, Mikawa, Tôtômi, Ise, Iga, Setsu, Harima, and the island of Shikoku were severely shaken, the earth opening in many places and throwing up mud and water. On the sea coast great waves rolled in and washed away many persons. A friend has kindly furnished me with a journal kept by a gentleman of Tosa during the earthquake. It runs thus ; " 5th day. At the hour of " the monkey (about 3.30 p.m.) a great shock came from N. " W. with a noise like that of a typhoon. The ground heaved " like waves of water for a long while. Afterward enor- " mous waves rushed up the rivers, and the city of Kôchi " caught fire. Seventy different shocks occurred in the " night. The weather was very cold. Mem. The shocks " were different in force and direction. The shocks at 8.30 " and 10 p.m. were severe. Some were accompanied with " noises, and sometimes noises were heard without any " shock. The shocks with noises were generally not so " severe as those without them.

" By the first great convulsion the earth opened, land- " slips took place from the mountains, rivers were flooded, " and all dwelling-houses and fire-proof store-houses were " either thrown down or severely wrenched. While we " all were standing helpless, there rose a flame in the " direction of Kôchi. As the night approached it spread

Digitized by Google

"rapidly, and its reflection from clouds made the night as "bright as day. At about 8 o'clock a great noise was "heard, and on inquiring its cause, I was told that great "sea waves were rushing in upon the land. The con- "fusion of the moment was indescribable. The people "all rushed toward the high land, some taking with them "nothing but the night clothes they had on.

"6th day.—The earth trembled forty-five times. Mem. "The temperature was unusually warm by day and cold "at night.

"7th day. The earth trembled fifty-three times Mem. "The water of the rivers became clear to-day."

This journal runs to the 26th 1st month of the following year, and shows there were shocks every day varying in number from one to fifty-three.

The following table taken from *San-sai-roku* (The three misfortunes *i.e.* earthquakes, fire, and waves) shows the number of shocks felt at Tosa in fourteen months (11th month 1854 to 12th month 1855).

		No. of shocks.	*1st magnitude.*	*2nd magnitude.*	*3rd magnitude.*
11th month,	1st year Ansei (1854) ...	247	7	44	196
12th ,,	,, ...	96	3	20	73
1st ,,	2nd year Ansei (1855) ...	115		8	107
2nd ,,	,, ...	63		7	56
3rd ,,	,, ...	43		6	43
4th ,,	,, ...	46	1	4	41
5th ,,	,, ...	33	1	2	31
6th ,,	,, ...	32		1	31
7th ,,	,, ...	36		6	30
8th ,,	,, ...	19		10	9
9th ,,	,, ...	20		2	19
10th ,,	,, ...	29		1	28
11th ,,	,, ...	18			18
12th ,,	,, ...	14			14

The total in the fourteen months was 817 shocks.

It was this earthquake which destroyed the town of Shimoda which had been opened as a foreign port in Japan. The Russian Frigate Diana which was lying at this place was caught by the retreating waves, and is

Digitized by Google

said to have revolved forty-three times in thirty minutes, and was so injured that she had to be abandoned.

A shock occurred on the 2nd day 10th month 2nd year of Ansei (1855) at Yedo. The *Japan Mail* of September 27, 1873, gave the personal experiences and observations of a former retainer of Rinnôji-no-Miya, whose Palace was situated at Uyeno. I cannot do better than quote from it to illustrate the dreadful scenes produced by the shock in the city. The retainer says "having returned to "my couch that night, but not fallen asleep, at about ten "o'clock I was started by the *karakami* (papered parti- "tion) near which I had laid down, falling suddenly and "without hands upon me. The night lantern (andon) "in my apartment was at the same time upset. and a fel- "low officer who lay near me cried out 'earthquake! earth- "quake'! which thoroughly roused me. I got up and "hurriedly attempted to dress myself; I put on my long "robe, and girdle, and was drawing on my *hakama* (loose "trowsers) when my companion feeling his way after me "stepped on one leg of my trowsers, and tore it off. I had "previously rushed into an adjoining room, and then seeing "that the paper lantern by the fire place in the floor was on "fire, had seized a tea kettle that stood near, and extinguish- "ed the fire of the burning lantern as also the live coals in "the fire place. Finding that my trowsers were minus "a leg, I groped my way back to my room, and snatching "up another pair, put them under my arm, and rushed "out as fast as I could, to find a place of safety in the "Palace court. But the house was rocking to and fro, "the plastered walls and the partitions were shaking as "with a violent ague, and the mud and boards were falling "all around me. The lintels of the door were shaken out "of their fastenings and dropping on all sides. Every "thing upon shelves such as clocks, crockery or whatever "it might be, was thrown down." After describing how he saved his master, who was then over fifty years of age, he says "I passed out of the premises to go home. As "I emerged from the gate, I had an extensive view of "the city, and saw flames burning forth far and near in

Digitized by Google

"every quarter. When I reached the foot of the hill on "which the Palace stood, I found the streets utterly im- "passable. The roofs of the houses on both sides had "fallen into them, and from beneath the debris the cries "of men, women and children were heard on all sides "calling for others to come to their rescue."

In the case of this earthquake it seems that the centre of the disturbance was in or near the city. Along the Tôkaidô, Hodogaya was the end of its radius of destructive effect, some houses of Kanagawa being thrown down. At Hmomoku, Kanagawa, Kamakura, Yenoshima, and Uraga sharp shocks were felt. Along the Nakasendo, Takasaki of Jôshin was the furthest end, Warabi and Omiya being greatly injured. Along the Nikkô-dô, Tsuchiura, and on the Kôshiu-kaido, Hachioji were the furthest ends. In the province of Shimôsa, Giôtoku, Matsudo and Ichika were violently shaken.

In the city itself those places which were swamps or shoals, such as Honjô, Fukagawa, Yoshiwara, Shitaya and Gojingahara where the Tôkiô Daigaku now stands, felt the shocks more severely than those high lands such as Banchô, Fujimichô and Hongô. Fissures were formed in the banks of Sumidagawa and Nihon-tsutsumi near Yoshiwara. The main buildings of the east and west Honganji, the Zôjôji, Seidô and Tôyeizan mido (or temple) were not injured at all. Mr. Nishimura an officer of the Mombushô observed at that time that the houses shaken down at Banchô and Fujimichô were those which were built with their greater length in the direction N to S. In all 14,241 dwelling houses and 1,649 fire-proof storehouses were overturned in the city.

The estimates of the loss of life in this and other great earthquakes are usually only vague guesses, and utterly unreliable. No official record of the number is known to exist. But in some of the popular accounts which were published absurdly exaggerated numbers are mentioned. For instance in Ansei Kembunshi the author gives 200,000, as the number of lives lost. He bases his estimate on the alleged supposition that five burials on an

Digitized by Google

average took place at each temple and as there were 40,000 temples, the total number would be 200,000. It is such untrustworthy statements that have been copied into foreign accounts and are represented in most of the books on Japan.

In the 3rd year Ansei (1856) a severe shock was felt at Sendai causing great damage to property.

On the 28th day 1st month 1st year Genji (1866) Tamba and Harima were visited by a severe shock, and it was most sharply felt at Sugihara-dani of Harima which is a village in a small valley. After the first shock of a long duration there were other less severe shocks almost every hour for five days.

On the 5th day 2nd month 5th year Meiji (1872) a great earthquake occurred at Yuwami and Idzumo, and Hamada felt it worst, the earth opening in many places and many lives being lost.

The above list comprises what from a careful inspection of the most reliable records may be admitted in my classification. It may be of interest to sum up in a brief manner the conclusions which the recorded facts authorize us to draw. The want of scientific method in the observation and description of the phenomena on the part of those who witnessed them is only too apparent. No instruments of any value for the more precise measurement of the direction or velocity of the shocks seem to have been devised or used. And although so far very little has been accomplished in other countries by the elaborate means employed toward determining the causes of earthquakes or measuring their intensity, or predicting their occurrence, we should have been glad to have been able to claim a greater degree of effort in this direction, where the circumstances are so favourable for observation.

1.—The records of the earthquakes during the past fifteen centuries do not justfy us in the conclusion that the era of destructive earthquakes has passed. We do not find that

Digitized by Google

they have decreased in frequency or severity. The present century has had its full quota of destructive shocks, and we have no right to assume that we are to be exempt for the remainder of this century, or during those which are to follow. This is a conclusion of no little importance from its bearing on the question of the best style of building in this country.

2.—The whole of the empire has been subjected more or less to shocks of earthquakes, although in a very different degree. The two great cities of Kiôto and Yedo appear to have suffered most (this is owing partly to the better records kept in the cities), the provinces Shinano, Mino and Tôtômi come next, Kishiu suffered seven times, Shikoku four times, and all other provinces except Suwô, Nagato and Aki once or twice.

3.—Regarding the distribution of earthquakes as to time, we find, we have had since the 5th century 149 destructive earthquakes in Japan distributed as follows :—

1	in 5th century.	7	in 13th century.
1	in 6th century.	8	in 14th century.
7	in 7th century.	15	in 15th century.
7	in 8th century.	8	in 16th century.
28	in 9th century.	15	in 17th century.
11	in 10th century.	13	in 18th century.
10	in 11th century.	16	in 19th century.
1	in 12th century.		

On an average there has been one severe earthquake in the country in every ten years, but I believe if records had been taken very carefully throughout the country the number of earthquakes felt during the fifteen centuries would have been much greater. If we take the nineteenth century alone we have had one great earthquake in every five years.

It is a remarkable fact that severe earthquakes have shown a tendency to arrange themselves in groups occurring in short intervals. For instance there were :—

Digitized by Google

6 in 827- 836 = 10 years.
6 in 880- 890 = 10 years.
4 in 1040-1043 = 4 years.
5 in 1493-1407 = 5 years.
4 in 1510-1513 = 4 years.
5 in 1645-1650 = 6 years.
5 in 1662-1664 = 3 years.
4 in 1853-1856 = 4 years.

If we take the 11th, 12th and 1st months of the Japanese old calendar as cold months; 5th, 6th and 7th as hot, and all others as mild, then during the fifteen centuries, 28 great earthquakes have occurred in the cold months, 47 in the hot, and 72 in the mild, or in other words, 75 in the extreme seasons and 72 in the mild the difference being only 3. Besides these there were two others, of which the times are not known.

4.—*Unusually high temperature.* Remarkable phenomena, which in the records are often mentioned as preceeding great earthquakes, are numerous; among others is unusually high temperature.

On the 14th day 10th month 13th year of Temmu Tennô (685) the weather was very hot, the heat of the ground penetrating through the soles of straw shoes, and peaches blooming. The weather was unusually hot in the 4th day 10th month 4th year Hôyei (1707). Yechigo was very hot on the 11th month 11th year Bunsei (1828), the water of the rivers and the rice fields becoming so warm that small fish were seen swimming near the surface. Kiôto was extremely hot in the 7th month 1st year Tempô (1830), and the people felt as though sitting in boiling water. In 1855 preceding the great earthquake Yedo was exceeding hot, in all these cases the unusual heat was followed by great earthquakes.

5.—*Unusual changes in the atmosphere.* Preceding the earthquake of 1766 a mirage was seen at Ôshiu. A mirage appeared for several successive days preceding the eruption of Unsengadake in 1792. The sky looked very low and the stars greatly increased in brilliancy preceding the earthquakes of 1828, 1847 and 1855. The following re-

Digitized by Google

markable incident is narrated in Ansei Kembunshi. A man at Yechigo experienced the earthquake of 1828, and at that time heard it mentioned that the sky looked low and the stars became larger before a severe shock. Ever after that time he surveyed the sky every night before he went to bed. He moved afterwards to Shinshiu where he noticed on the night preceding the earthquake of 1847 that the stars were unusually bright. He moved again to Yedo, where he noticed once more the same phenomena on the night of the 2nd day 10th month 2nd year Ansei (1855). Fearing that this foreboded an earthquake he hurriedly brought out mats, and cooked his rice on a fireplace temporarily constructed on the ground, and made all necessary preparations for the coming catastrophe. Several friends of his, who at first were induced by him to remain out of doors with him, becoming tired of waiting for a thing so uncertain went back into their houses, and he alone trusting his own experience stayed on the spot. What soon followed at about ten o'clock, and caused such destruction to the city of Yedo has already been described.

6. *Luminous appearances and magnetic disturbances.* —The light seen at Yechigo (1751) has already been mentioned. Mr. Mitsukuri Gempo was at Shimoda at the time of the earthquake of 1854, and saw for three successive nights preceding the occurrence the sea brilliantly illuminated. At Shinagawa the same phenomenon was seen in the day preceding the great earthquake of 1855. On the same night a magnet kept in an eye-glass shop at Asakusa dropped old iron nails and keys attached to it at about 8.30 P.M., and the shopkeeper thought that the magnet was becoming too old and had lost its power. But after the earthquake which occurred at 10 P.M., it regained its power and attracted the nails and keys as before. He concluded therefore that before great earthquakes magnets lose their power, and contrived a machine for predicting them, a diagram of which is here given. An iron nail fastened at an end of a cord is attached to a magnet, and a weight just sufficient to balance at the other end of the cord is hung on a wheel. When

Digitized by Google

by a magnetic disturbance the nail drops, the weight falls causing the wheel to turn, this again causes another wheel to turn which makes a hammer to strike an alarm. Magnetic disturbance may certainly occur before the great earthquakes, but the phenomenon does not seem to be uniform, and certainly before light shocks such as we have experienced here in Tôkiô during the last two years the loss of magnetic force has not been observed.

The phenomena which are believed in Japan to follow great earthquakes are expressed in the following verse which is well known among the people, it reads thus ;

Kuwa yamai,
Gohichi ga ameni,
Yotsu hideri,
Mutsu yatsu kosowa
Kaze to koso shire.

Or in English

These are things
An earthquake brings;
At nine of the bell, they sickness foretell,
At five and seven betoken rain,
At four the sky is cleared thereby,
At six and eight comes wind again.

The appended list contains the titles of the books which I have consulted in the preparation of this paper.

1. Nihon Shoki..... 日本書記
2. Zoku Nihonki..... 續日本記
3. Ruiju Kokushi..... 類聚國史
4. Go Kwanjo..... 後漢書
5. Nihon Gwaishi..... 日本外史
6. Odai Ichiran..... 王代一覽
7. Toyotomi Fu..... 豐臣記
8. Sandai Jitsuroku..... 三代實錄
9. Taiheiki..... 太平記
10. Hôjôki..... 方丈記
11. Jishin Nendaiki..... 地震年代記
12. Ojishin Rekinenko..... 大地震歷年考
13. Chidôko ..... 地動考
14. Bonshun Nikki ..... 梵舜日記

Digitized by Google

15. Hokusô Sadan..... 北窓瑣談
16. Kokuriôki ..... 谷陵記
17. Oritakushiba-no-ki..... ..... 折焚柴記
18. Heike Monogatari..... ..... 平家物語
19. Kunmo Tenchi-ben ..... 訓蒙天地辨
20. Bunrui Honchô Nendaiki ..... 分類本朝年代記
21. Tenchi Wakumonchin ..... 天地惑問針
22. Sansai-roku ..... 三災錄
33. Taihei Nenpio ..... 泰平年表
24. Tôyuki ..... 東遊記
25. Ansei Kembun-shi..... 安政見聞誌
26. Ansei Kembun-roku ..... 安政見聞錄
27. Shokoku Jishinki ..... 諸國地震記
28. Jishinkô ..... 地震考
29. Bukô Nempiô..... 武江年表
30. Jishin Setsu.. ..... 地震說
31. Shinrai Kosetsu .... 震雷考說
32. Nendaiki Zukwai..... 年代記圖解
33. Chisai Saiyô..... 地災採要
34. Jishin Nikki .... 地震日記

Digitized by Google

NOTES ON THE MANUFACTURE OF OSHIROI (WHITE-LEAD).

BY

R. W. ATKINSON, B.Sc.

Read before the Asiatic Society of Japan on the 28rd March, 1878.

—o—

Recently I had the opportunity of seeing in operation the process by which the substance known as Oshiroi is prepared, and from the extensive use of the substance as a cosmetic, as well as from the number of other uses to which it is put, it seemed to be a subject of sufficient interest to warrant a short note on its manufacture being laid before the Society. So far as I am aware no one has yet made any mention of this process, which possesses considerable interest to chemists, whilst the extensive use of the material as a cosmetic offers a field for medical research on the subject of lead-poisoning which it would be difficult to find in any other country.

Numerous cases are given by Dr. Taylor in his Treatise on Poisons, of lead-poisoning resulting from the use of white-lead as a cosmetic, though it is proper to state that the inference drawn from these cases is disputed by M. Tanquerel, who maintains that so long as the powder does not come in contact with any abraded surface, absorption into the system does not take place. And so far as I can learn, from the evidence of Mr. Nagayo, Chief of the Department of Public Health in Japan, as well as

Digitized by Google

from conversations with actors and others, none of the usual symptoms of lead-poisoning have been noticed here as the result of the use of Oshiroi, though such appearances have been found amongst the workmen engaged in its manufacture, and who continually breathe air impregnated with the dust resulting from its grinding.

This absence of injurious action may, however, be caused by the presence in the powder used for the toilet of a large proportion of starch, which would reduce the number of points of contact between the powder and the skin, though this is a question which I must leave others to decide.

The present note contains a short description of the *oshiroi* works belonging to Mr. Murakawa, of Kiyôto, who gave all the information asked for with the greatest readiness.

The furnace employed in making white-lead is built up in a most curious fashion. A good solid floor is first selected and upon this is built a platform of brick about 1 foot above the ground, with, at intervals of about 3 feet, a recess. Over this recess a half-barrel is placed about 2½ feet high, in the centre of which is a grating made of bamboo, upon which the rolls of metallic lead rest. The recess referred to above is closed in at the top, with the exception of a round aperture in which a coarse earthen dish rests, for the purpose of holding vinegar. The space round the dish is carefully filled up with clay, so that to all appearance there is no communication between the recess and the space above the earthen dish. Upon the upper part of the half-barrel rests a *saké-daru*, one of the tubs used for holding *saké*, and upon the top of this one, another is placed, and so on to the number of 4, the whole structure having a height, from the level of the brick platform, of about 11 or 12 feet. The lower part of the barrel is a little wider than the upper part, so that the upper barrel covers the lower one to a small extent, and the space between the two is filled with clay. Before the apparatus is put together the plates of metallic lead have to be prepared. The lead used at these works was brought from Marseilles. It is first melted at a low temperature,

Digitized by Google

and then poured upon a shallow iron dish shaped like a shovel. The contact with cold metal causes the lower part to become very quickly solid while the upper part is still liquid. The latter is then poured away, and a thin sheet of lead is produced, one surface of which is rough, and therefore presents more points of contact for the action of the vapour of acetic acid. These sheets are then rolled up, and packed vertically upon the bamboo grating before mentioned. The first barrel is now placed on the top of the half-barrel and likewise filled with rolls of lead in the same way, and so on, each barrel as it is put in position is packed with lead, while the uppermost one is covered with a wooden cover, and the edges tightly closed by means of paper and *funori*. In the works visited there were in all 21 of these furnaces, all of which were charged at the same time. Weak vinegar is now placed in the earthern dish through an opening in the half-barrel and a *hibachi* is introduced into the recess, so that it heats the bottom of the dish and causes the acetic acid contained in the vinegar to be volatilized. The position of the *hibachi* in the recess is to be carefully regulated in order to avoid an excessive heat which would cause the vinegar to be wasted. Fresh vinegar is added from time to time as it is required, about 7 *shô* in each day for each furnace being the average amount. The temperature at the bottom of the furnace was found to vary in different cases from 127° F. to 148° F. As all the furnaces were closed at the top, and removing the covers would cause a loss of vinegar, it was impossible to measure more than one, which we found to be 114° F., the temperature at the bottom of the same furnace being 132° F., a difference of 18° F.

At the end of 20 days the covers at the top are removed, and if the surface of the lead is found to be coated with a white powder (*hana*), the process is stopped, though the whole of the lead has not yet been converted into the carbonate. The apparatus is allowed to cool, and each roll of lead as it is taken out is beaten to remove the scale of white lead with which it is covered. This

Digitized by Google

scale is then placed under water in wooden tubs and constantly agitated by means of wooden poles, in such a way as to break it up into the finest possible particles, the milky liquid being then passed through fine sieves and collected in a settling vat. This process of levigation is carried out in exactly a similar way to that by which the finer kinds of porcelain clay are obtained. In the centre of the settling vat, (which is about 3 ft. high × 3 ft. in diameter) there is placed a cylinder of bamboo-gauze covered with fine cloth in order to prevent the passage of any solid particles into the interior, and the water which finds its way through the cloth is drawn off by means of a syphon. In this way the water is rapidly removed, and a thick paste is obtained which is further dried in shallow unglazed earthenware dishes, about 2½ inches deep and 7 inches square, piled upon one another to a considerable height. Sometimes these are placed on the tops of the furnaces in which conversion is taking place so that they are gently heated, and by this means the cakes of white lead are more quickly dried. Before they are quite dry the cakes are cut into square pieces for the convenience of purchasers, and covered with paper. This forms the first quality of white lead. A second quality is obtained by grinding the residue left in the vats and on the sieves in stone mills, and submitting this ground material to levigation and drying as above described.

The weight of lead put into the 21 furnaces amounted to 4,200 *kuwam-me, i.e.* 200 *kuwan* in each furnace. The vinegar used per day for all the furnaces was 7 × 21 *shô* = 147 *shô* or 1 *koku*, 4 *to*, and 7 *shô*, therefore in 20 days, 20 × 1·47 = 29·4 *koku* were used. It was found to contain ·942 per cent. of acetic acid, and hence the total amount used was 13·5 *kuwamme*.

No very certain information was obtained concerning the amount of white lead produced in one operation, the workman saying that 2,000 *kin* were produced, and also that it filled a barrel, which was afterwards ascertained to have a capacity of 28¼ cubic feet and when full this would hold

Digitized by Google

8,900 *kin* of white lead, a number considerably different from the one given by the workman. It is probable that the real number lies between the two above given, but assuming the lower one to be correct, it proves that a theory of the production of lead carbonate given by Dr. Ure, viz that hexa-basic acetate of lead is first formed, and by slow combustion is converted into carbonate of lead and water, is not true even in this case where it is not evident from what other source the carbonic acid can come. On the above mentioned theory the 13.5 *kuwam-me* of pure acetic acid used in the process could produce only 170 *kuwam-me* of white lead, against the 2,000 *kin*= 320 *kuwam-me*, actually produced.

The composition of the white lead produced (from analyses made by Mr. Takamatsu, of the Tôkiyô Dai Gaku) corresponds with that prepared by the Dutch and German methods.

Oxide of lead.....	86.42 per cent.
Carbonic acid.....	11.60
Water.....	2.00
	100.02

Those who are familiar with the two foreign processes just mentioned will see from this brief description, in what points the Japanese method differs from them. Whereas, in the foreign methods the source of the carbonic acid is well known, in the process carried out in this country, every care appears to be taken to exclude the gases which rise from the charcoal fire used to heat the vinegar, but in the absence of any other means of supply, I see no way to account for the successful conduct of the process, except by supposing that the products of the combustion of the charcoal leak in through accidental crevices, though only in one case was I able to detect any. This is the only explanation I can offer, unless, indeed, the workmen had exercised a not unusual reticence, and had omitted to mention the use of limestone or of some other substance from which the carbonic acid could be derived.

Digitized by Google

The white lead is sold of several qualities, the best and second best being unmixed with any other substance, and costing 20 *sen* and 18 *sen* per *kin* respectively. The two lower priced kinds are mixed with starch (called in this case Ukiko, floated powder, probably on account of the method followed in separating the starch granules), in the proportion of 7 *kin* white lead to 10 *kin* of starch.

If we compare the price of white lead in this country with its cost in England, we find it to be rather more than twice as much, and it is therefore, somewhat surprising that while the makers of white lead here import the metallic lead from which it is produced, there seems to be no importation of the finished product, except in Nagasaki, where in the British Consular Reports for 1875, the imports of red, white and yellow lead altogether amount to no more than $1,317.

Postscript.—Dr. Anderson has very kindly given me the following notes upon the influence of lead preparation upon the health of those using it, with permission to publish them.

"The effects are apparently limited to an alteration of the colour of the skin to a dull dusky hue when the use of the substance is prolonged over many years, with, in some cases, and especially in the most inveterate painters, old prostitutes for example, an indentation of the surface with very minute closely-set wrinkles, or rather linear depressions. A similar condition is sometimes seen in European actresses after ten or more years stage experience. No symptoms of absorption appear to occur even in the Yoshiwara. This is probably attributable to the fact that the process is always very slowly effected by habitually exposed surfaces, and although there is little or no doubt that absorption may take place, it is so slow that elimination by the kidneys is able to keep pace with it, and hence no deposit in the tissues occurs."

* * * * * * * * *

"The cases quoted in our works on Toxicology are too few to be of any value. The use of lead cosmetics is pretty widely spread in Europe, and, were absorption to

Digitized by Google

any material extent by an unbroken and exposed surface possible, cases of plumbism so contracted should be common. In exceptional instances a chapped or cracked condition of the cuticle might however allow a sensible quantity of the poison to enter the system, and this may have been the explanation of the symptoms in the cases recorded by Orfila and others.

The starch so freely intermingled with the lead preparation would undoubtedly act as a diluent, and it is quite possible that by absorbing more or less of the cutaneous transpiration it might impede the entrance of the metal, but this I can say nothing about."

Digitized by Google

Digitized by Google

ASIATIC SOCIETY.

A General Meeting of the Society was held on Saturday, 23rd March, Sir Harry S. Parkes, President, in the Chair.

Announcement was made of the appointment by the Council of Mr. W. G. Dixon, as a member of the Library Committee. Mr. Atkinson then read "A Note on the manufacture of Oshiroi (white-lead) in Japan."

Dr. Divers said that in a Japanese account of the process just described, which had been translated for him, the author, mentioned that in China calcined oyster shells were employed by some makers, but the author himself did not consider the change an improvement. If they were employed here that would account for the only part of the method which was obscure.

Mr. Atkinson said that he had seen the residue left in the earthern pots after evaporation of the vinegar, and saw no evidence of the addition of any substance. He was inclined to consider leakage of the products of combustion into the furnace as the true explanation.

The President thanked Mr. Atkinson for his practical and useful note and remarked that the plan of receiving such short papers promised to be successful, as they had been supplied to each of the three meetings that had been held since the plan was proposed.

Mr. Hattori then read a paper entitled "Destructive Earthquakes of Japan."

The President congratulated Mr. Hattori on his paper and the Society on possessing such an intelligent Japanese member. He had succeeded in making a dry and difficult subject attractive by supplying many interesting incidents and had dealt with it in as philosophical manner as his data would permit. It was not surprising that earthquakes should be common in such a volcanic country as Japan, which presented a new field for observing such phenomena. They occurred through the whole chain of islands from north to south and extended to Formosa and the Phillippines. Those of Japan were evidently common alike to all seasons of the year, and their frequent association with tidal waves was worthy of notice. Although, as Mr. Hattori remarked, much progress had not yet been made in the science of the subject, the question of how houses might be built so as best to resist earthquake shocks was a practical and important one. He had lately been informed by the Chinese Minister that he found in parts of Formosa, which he had visited, that the people provided their residences (which are probably not large) with

Digitized by Google

fixed bed places and tables of sufficiently solid construction to protect those who took shelter under them from the danger of falling roofs. He thought that the comparative frequency of earthquakes in Japan in the last century might be attributable to their having been more carefully observed in later than in earlier years. It was at all events satisfactory to the Society to know that in the destructive earthquake of 1854, which did so much damage in Tôkiyô, the place where they then held their meetings escaped uninjured.

Mr. Tsuda said that during the great earthquake of 1854 he was at a place called Sakura, about 12 *ri* to the east of Tôkiyô, and there he distinctly saw the earth move up and down several times. He thought that the first shock was felt about one hour later in Sakura than in Tôkiyô.

Dr. Veeder said that he had hoped that Mr. Hattori, in summing up the results of his very interesting investigations, had ascertained the frequency of the occurrence of destructive earthquakes at a few of the more important centres of population, as at Tôkiyô. Mr. Hattori had shown that, taking the empire as a whole, such catastrophes had occurred upon an average once in ten years.

His attention had been drawn to a general inquiry of this kind by witnessing a somewhat destructive earthquake in San Francisco about ten years ago. He had found that while in Syria as a whole, which appeared to resemble Japan as an earthquake country, these convulsions had occurred perhaps quite as frequently as anywhere else, except perhaps along the Andes in South America, yet in particular places, as in Antioch, which had several times been almost wholly destroyed by earthquakes, the smallest interval between two very destructive epochs was about sixty years.

It is certainly alarming to learn that the records of the present century show an average of one great convulsion somewhere in Japan every five years; but if it should be found that these most fearful events happen only once in fifty or sixty years in any one locality, the fact would be a reassuring one.

In the earthquake of 1868 in San Francisco and vicinity he had noticed that while a few unfinished brick buildings were injured, and many badly constructed dwelling houses showed cracks in their walls, the most massive hotel in the city, six lofty stories in height, was wholly uninjured. The great number of small and well-framed apartments in the hotel undoubtedly contributed to its safety. This opinion was confirmed by the condition of a Spanish house of two stories built of adobe or sun-dried bricks and situated about thirteen miles nearer than San Francisco to the chief centre of disturbance. Large portions of the outside walls of this house were levelled to the ground, leaving the interior walls or partitions standing almost intact.

Dr. Veeder remarked further that both shores of the Pacific Ocean are earthquake regions; and that it is the opinion of some eminent authorities that there are lines of fracture in

Digitized by Google

the earth's crust running north and south near the western coast of North and South America and the eastern coast of Asia.

Dr. Murray remarked that the earthquake of 1854 which destroyed the town of Shimoda had been used for a very interesting scientific purpose, viz. for determining the depth of the Pacific Ocean. This earthquake caused a series of immense sea waves which at Shimoda were about 30 feet high. They were transmitted across the Pacific, a distance of 4,500 miles, in a great circle, and were recorded on the self-registering tide gauges at San Francisco. The maximum wave was about 18 inches at San Francisco. The time required for the transmission was 12 hours 36 minutes. Hence the velocity was about 360 miles per hour. The wave crests succeeded each other at intervals of 23 minutes, hence the wave length must have been 150 miles. Now, it was a law of wave motion in water that the velocity was greatest in the deepest water, varying as the square root of the depth. This law and the observations on the Shimoda earthquake enabled Professor Bache, at that time Superintendent of the U. S. Coast Survey, to compute the average depth of the intervening ocean. The great earthquake in 1868 at Arica in Peru gave Professor Hilgard the material for a much fuller discussion of the same subject. His conclusion was that the Pacific was deepest at its equatorial and Eastern parts, and more shallow towards the North. It is interesting to add in connection with this that the soundings made by Commander Belknap in 1874, an account of which was furnished by him to this Society, in a remarkable manner confirm the deductions of these scientists. Dr. Murray added that while the origin of earthquakes was still very far from being ascertained, except that perhaps in a general way they were due to the secular cooling and shrinking of the earth, still great progress was being made in a knowledge of the nature and effects of the movements caused by the shocks. After all, this was the most useful kind of knowledge, because it bore most directly upon the methods by which buildings might be made to withstand their destructive effects. Japan is a land of earthquakes, and they might naturally look as a result of the experience of the centuries of earthquakes, which Mr. Hattori had described, for a survival of the fittest forms of building. Unfortunately their experiences had been confined almost entirely to building with wood, and very little could be learnt in regard to the safest methods of using stone, brick and iron, which composed the principal building materials in western countries. With regard to wood their experience had shown that a building with an elastic framework supporting a massive roof was well adapted to receive uninjured the quick violent motion attending a shock. The safety of most of their large temples, and of the tall pagodas, during the great earthquake in Yodo in 1854, proved the correctness of the general plan on which they were built. But when they came to use material like brick and stone, then the same principle could no longer be

Digitized by Google

admitted. Here without disintegrating the walls, an elastic motion of the particles, such as would be safe in a wooden frame, could not be permitted. It remained, therefore, to construct a building as stiff as possible, binding its parts together by means of its cross walls and its networks of floor and roof timbers, making it as far as possible one compact mass. In view of the importance of this matter they could not but look forward both with interest and concern to the effect of a destructive earthquake upon the brick buildings which had been recently erected in this city.

Mr. G. Cawley thought that Dr. Murray was mistaken in supposing that a Japanese house was notable for stiffness, for on account of the parallelogram-like form of the framing, and the absence of diagonal struts or ties, it was remarkable rather for flexibility. The advantages of the heavy roof appeared to be limited to small earthquakes of short duration. Under these circumstances it resembled a heavy-headed walking stick poised upon the tip of the finger, which exists in a state of conditional stability, and owing to the pliability of the framing, the heavy roof would remain sensibly still in space. But if the vibration continued until the roof was put in motion by the partial rigidity of the support, he considered that its stability would depend upon the mutual relations of the oscillations of the roof and earth. If at any instant the vibrations had equal amplitudes and were of opposite phases, they would neutralize each other, but if at any moment they agreed in phase and were of the same amplitude, which he thought very likely to occur, the effect tending to the destruction of the structure would be due to their sum. He concluded, therefore, that heavy-roofed houses might be sufficiently stable during short earthquakes, but in the case of earthquakes of long duration, with vibrations varying in intensity and direction, such structures were more likely to be a source of danger. He considered that this conclusion was borne out by the facts mentioned in Mr. Hattori's paper.

It was, perhaps, too early to express decided opinions upon the stability of brick buildings in this country, but his observations tended to show that they resisted earthquakes in a satisfactory manner, when well-erected and made of good material. He had noticed that the form of the building in plan affected the stability of the structure in a marked manner, a building symmetrically shaped being much more secure than one of irregular form. He could point to a round chimney in Tôkiyô of considerable height which had withstood earthquakes occurring since its erection five years ago, without any sensible damage, while other buildings of apparently equal strength but of less regular form had suffered severely. Few persons gave full credit to the elasticity of well executed brick buildings, but he felt sure that were this characteristic of good brick structures better understood, such buildings would be more largely erected, and a feeling of comparative safety would be enjoyed which was not the case at present.

Digitized by Google

Mr. Ayrton thought that the loss of the description of the secret springs and wires in the seismograph used in China in A.D. 132 was not much to be regretted, seeing that the balls in the dragons' mouths themselves took the place of the mercury in Professor Palmieri's instruments, by their inertia remaining at rest when the earth during the shock moved relatively to them.

Mr. Hattori having been so kind as to lend him (Mr. Ayrton) the paper for a few hours, he had endeavoured to see if any connection could be drawn between the periodicity of earthquakes in Japan and any other well known natural phenomena, as for instance sun spots. The method he had employed was to divide the whole period embraced by Mr. Hattori's report into equal periods of 33 years, then having decided upon an arbitrary scale of intensity based on the relative destruction produced by the various earthquakes, to add together the intensities of all the earthquakes in each one of these periods.

The single number thus obtained was used as an ordinate for drawing the time curve. This was seen to consist of many waves, but the general rising and falling showed a sort of periodicity for greater destruction, the first two periods occupying about 200 years, the third 350 years, and the fourth about 250 years, but it was quite impossible from this to foresee what the next period would be.

He had also attempted to compare the times of the eclipses of sun and moon, as well as the conjunctions of the planets with those of the destructive earthquakes given in the paper, but without success. He thought, however, that a calculation of the times of such conjunctions would probably be found to repay the trouble so expended.

Mr. Ayrton also referred to the remarks of previous speakers on the method of constructing buildings to withstand earthquake vibrations. Mr. Perry and the speaker were about to publish a small pamphlet on this subject, and their investigations had led them to the conclusion, 1st, that a heavy roof or top to a chimney was misplaced, and that the mistake of employing such a construction arose from the idea that the momentum imparted to a building during an earthquake was a constant, whereas it was the velocity of the earth at the base of the building that was really the constant quantity; 2nd, that it was due to the viscous resistance opposed by the numerous joints and to the lavish employment of timber that the slowly vibrating Japanese house owed its comparative security; 3rd that as it was desirable that the parts of a house should resist tensile as well as compressive stresses, either good concrete in preference to bad mortar should be employed in an earthquake country, or better still a well jointed timber framework not too rigidly fastened to the ground; 4th, that if it were necessary to use small stones with not very good cement then that the foundation of the house should be of a yielding nature having rather a long time of vibration.

In concluding the discussion the President observed that the question of whether the Japanese mode of architecture

Digitized by Google

was well suited to resist earthquakes was one on which great diversity of opinion existed, and it had lately been condemned by several professional writers. He thanked Mr. Hattori in the name of the Society for his interesting paper, and hoped that many of his countrymen would be encouraged by his example to join the Society and become contributors to its transactions.

The meeting was then adjourned.

Digitized by Google

SOME REMARKS ON CONSTRUCTIONS IN BRICK AND WOOD,

AND THEIR

RELATIVE SUITABILITY FOR JAPAN.

BY

GEORGE CAWLEY, Esq.

Ready before the Asiatic Society of Japan, on the 11th May, 1878.

Any subject which affects to treat of the welfare and safety of our dwellings may be discussed, I apprehend, without any prelusive apology being necessary for its introduction. That "there is no place like home" is well remembered, at least, from the beautiful and pathetic lyric known in every clime where the English language is spoken; and if we but divest this expressive line of the poet of its poetic character, and accept it in its local sense as a bare statement of fact, we shall at once admit that the subject, upon which I am going to solicit your attention, is deserving of careful and attentive consideration and treatment. With regard to the treatment, however, it is well to state at the outset that there is some fear of its being both imperfect and incomplete; as, apart from any question of personal disability, I have been unable to devote such attention to the subject as it is worthy and capable of receiving. However, if any remarks which fall from me arouse others, more specially

Digitized by Google

qualified, to action in handling a topic of such close and general interest as the safety and comfort of the houses of Japan, some claim may be made of having indirectly effected some ultimate good.

The question which involves the consideration of the relative value of brick and wood buildings is by no means a novel one, and has been discussed at various times, both in Europe and America, by advocates having favourable opinions of structures built of either the one or the other material; so much so that, if the subject before us referred to the buildings of the above-named places of highly civilized life, any further comment might be justly considered as futile and superfluous, for experience has long ago decided the question with them. But we all know that this country is sensibly, and in some respects materially, different from western lands in her social, climatic, and general physical conditions. Here, in the Empire of the Rising Sun, Nature seems to carry on her work with greater grandeur, and with more startling effects than in many lands: we have typhoons sweeping along destruction over sea and land; we have mighty rains, and floods, and tidal waves, exceptional in character and fury; and we experience meteorological and telluric phenomena which are of an awe-inspiring and dreadful description. Considering this, then, although the question engaging our attention is not new in itself, it is put in a new light as a consequence of the difference of physical conditions this country affords. Having thus far endeavoured to show that the altered circumstances we experience in Japan justify the discussion of an old question in relation the these changed conditions, I shall now proceed to consider the subject proper.

For the more convenient arrangement of this paper it may be useful, in commencing, to roughly classify the essential qualities which ought to exist in an architectural structure, and then discuss, in a serial manner, to what exent purely Japanese buildings embody these respective qualties. Afterwards, I shall have something to say on the buildings that have been erected in foreign style in this country;

Digitized by Google

and shall state my opinion of the value of these innovations in fulfilling the conditions necessary to make a structure suitable for the land we reside in. Finally, I shall briefly put forward, with due deference, the conclusions arrived at from my own observation and experience, with regard to the structures of durability best adapted for earthquake countries. In what follows, the term building will be used in its generic sense as including any construction of an architectural character.

An architect, in designing a building to meet the exigences of highly-civilized communities, has in view several primary conditions, which must be fulfilled to a greater or less extent; and these conditions may be roughly classified and named as (1) strength, (2) stability, (3) durability, (4) comfort, (5) convenience, (6) beauty, and (7) good hygeian qualities. There are, besides, subordinate conditions relating to local, social, and moral interests, which the architect has to examine and attend to, if he regards his reputation; but for the present purpose we may neglect them, and limit these remarks to the leading conditions just described.

Purely Japanese dwellings are, almost without exception, built of wood, and in a style more or less peculiar to the country. Even the chequered tile and plaster constructions, so familiar to residents in Japan, which surround and hem in the old *yashikis* of the once feudal lords, are essentially made of timber; as the tiles simply form an outer covering to the wood framing and roof. The same may be asserted of the fire proof store houses; or, strictly speaking, the majority of them. I may mention here, however, that a few weeks ago while travelling through the provinces of Kôdzuke and Shimotsuke, I observed that these storehouses were built of stone, roof included. As I passed through the same district about two years ago and failed to notice them, there is reason to infer that they may be of recent construction.

The peculiar style and arrangement of material adopted by Japanese constructors of buildings has drawn a rapturous and unqualified praise from some foreign critics

Digitized by Google

at various times. They have pourtrayed what remarkable insight is displayed in the design; and how the cumbrous roof, the flexible framing, and the mode of connection with the earth, are but so many ingenious applications of natural laws for nullifying seismic phenomena. What detracts, however, very much from the value of this panegyric is the simple fact that these critics claim more for the Japanese than the Japanese claim for themselves; for, as far as I have been able to learn, the features which have received such eulogistic treatment are due more to inexorable custom than thoughtful design. Without venturing an opinion for the present as to the validity of such criticisms, and how far they are consistent with, and supported by, accurate observation and trained experience, it may be well to examine Japanese structures by the light afforded from the matured experience of other countries, and ascertain to what degree the leading qualities, above assumed essential in a building, are incorporated in their construction. The object in view being a simple inquiry after truthful results, and the aim of this inquiry to determine whether the purely native style of building is, or is not, the best that can be devised for its intended purpose, it is therefore my intention to let it stand upon its intrinsic merits, and test its correctness by a few simple general principles. If it can be shown, after a fair and impartial examination in this manner, that the native style is the fittest and the best, I conclude it will have lost none of its reputation in having undergone the judgment of this Society: on the other hand if it should be decreed wanting in any essential respects, and inferior to other modes and arrangements; then my opinion is that the sooner it is eradicated and replaced by a more suitable one, the better for the comfort and general welfare of the people of this country.

In the first place, let us consider what claim a Japanese building has to strength. I mean relative rather than absolute strength; that is to say, strength combined with lightness. Do we find in it the maximum strength obtain-

Digitized by Google

able from the material used? For this is one of the chief points to be considered. It includes not only the relative strength, but also the general economy of buildings.

There is a guiding axiom in constructive science which asserts, though in somewhat paradoxical language, that "the maximum strength of any structure is that of its weakest part," or, it is sometimes figuratively rendered as, "the greatest strength of a chain is that of the weakest link;" and from this we may infer that, the greater the variation between the strongest and the weakest parts, the more faulty the proportion, statically considered, and the more useless consumption has there been of the material employed. This useless consumption is not merely a direct loss due to the primary cost of the material wasted, but it is an indirect loss also: for its weight alone tends to bring the whole structure to premature destruction and decay. It follows from this general principle that a good and correctly designed building should not only be absolutely strong, but equally and comparatively strong. If it has a weakest part it should be known, and located in some unimportant part of the structure. The localising of the weakest part, by intention, in some subordinate position in the structure is a proof of careful design; and is often resorted to in machine designs, to prevent the rupture of the principal members. If Japanese buildings are viewed in this light, as regards strength, I have little hesitation in saying that they will be found exceedingly faulty and primitive in design.

Primeval man may be supposed to have made his first attempt at bridge-building by throwing a log across a stream, and it would not be difficult to prove that the principle of Japanese structures (let them be temples, or dwellings for the prince or the peasant) has ascended but little above that embodied in the primitive bridge. I feel certain that any person conversant with the subject, who has observed the stepped or terraced arrangement of the framing of a native roof, or the mode of forming a native bridge, will support this proposition, and will admit that in both examples there is a lavish waste of timber; for

Digitized by Google

this arrangement simply consists of a series of beams supported at the ends, and loaded between; and the principle involved is exactly similar to that in the supposed pristine log-bridge just alluded to. The ponderous eaves seen on the roofs of most large temples have their materials arranged even to worse advantage than this, where a multitudinous array of rafters overhang a great distance as cantilevers, without any bracketal support. It may be timely to add here, that I am purposely neglecting any question of architectural beauty, as I shall speak of that in the sequel separately.

The crude and unscientific disposition of material observable in native structures, notwithstanding their imposing grandeur and elaborateness of detail, in many cases, leads to the conjecture that the constructors were ignorant of the value of braced or trussed framings, where the material can be put in such order that each member of the structure is equally strained with a simple stress, and the centre of stress be made generally to coincide with the centre of figure. They also have ignored the use of diagonal members in their framings, and preferred the rectangular to the triangular division into bays. Some have attributed the absence of diagonal pieces to earthquake considerations on the part of the constructor, but I think it probable that this feature arises more from custom than preconceived intention; for in the case of simple fences where earthquakes need not be taken into account, and where an inclined stay would prove so effective, we may notice that the rectangular arrangement is employed. It need scarcely be said that the rectangular is far inferior to the triangular division for ensuring stiffness and rigidity, as the latter is based upon the simple geometrical proposition which asserts that we cannot alter the angles of a triangle without altering the length of its sides. With regard to braced structures generally, it must be granted that without the use of iron straps and bolts to connect the tensional members, it is somewhat difficult to obtain full benefit from them; and this fact might account, in some measure, for the Japanese not

Digitized by Google

adopting this method of construction, as, on account of its cost, they use iron sparingly.

With regard to the strength of purely native structures the conclusions I draw, and which are based upon the reasons just given, are that the generality of them are certainly weak, when compared with the quantity of material employed. I also consider them primitive and faulty in the principles of design, and lavishly wasteful in constructive material.

I propose now to take up the question of stability, as regards native edifices, and treat it as far as the brief limits of this paper will allow. In non-earthquake countries the natural forces affecting the stability of a building are few and simple in character. They consist principally of forces due to gravity and the pressure of the wind; and with the ample data we have concerning such forces, the question of stability simply involves an easy statical problem. Indeed, in the absence of earthquakes, the conditions of strength generally comprehend those of stability to a large extent. This relation of strength and stability does not hold fully, however, in a building subject to earthquakes; and, for the sake of illustration, I may say much more is it separated in the case of a ship, which may be exceedingly strong, but very unstable. As the greater number of Japanese buildings have a spacious base, compared with their height, it should follow as a consequence that they are very stable—and certainly an extensive base area is an element of stability. But let us examine the superstructure resting upon this base, and inquire how it fulfils its office during an earthquake. The vertical frame-work is devoid of any diagonal members and is therefore very flexible, and has generally to support a massive roof. Now if from any cause the vertical supports are thrown out of their true position, they can regain that position only by the elasticity of the various joints, and in opposition to the action of gravity on the heavy roof.

At the March meeting in Tôkiô, during the discussion which followed the paper on earthquakes, I expressed an opinion that heavy-topped structures were a fallacy in

Digitized by Google

an earthquake country; and since then I have read a pamphlet, bearing on this subject, published by Professors Ayrton and Perry, in which they hold similar opinions. I am pleased to have my views corroborated by the opinion of these gentlemen, for they have given considerable attention to the subject, and their assertions ought therefore to carry some authority. In order to illustrate my views, a massive roof supported by flexible supports during an earthquake, was likened to a heavy-headed stick poised upon the finger, and I stated that both the roof and the head of the stick were in a state of conditional stability—the required condition being, in the case of the stick, that the motion of the finger must harmonise with that of the heavy head, and thus neutralise its tendency to fall. When this harmony of motion ceases to exist the stability is destroyed. Now if we mentally transform the heavy head into a massive roof and the finger into the vibrating ground, it seems to me that we can predicate that the features of stability of a heavy-topped roof, during an earthquake, are precisely similar to those of a stick balanced upon the finger.

Since it is extremely probable that during an earthquake shock the earth vibrations vary greatly in amplitude, direction, and period of vibration; it appears impossible, under these circumstances, for the earth and roof to oscillate isochronously during the time of a long earthquake. While the relative motions of the earth and roof are isochronous, of equal amplitude, and of opposite phases, the stability may possibly be preserved; but if these favourable conditions be not fulfilled at any moment—and I believe they cannot be fulfilled for more than an instant—then, the stability of the roof is simply dependent on the rigidity of the framing beneath it—and in the absence of diagonal members, we may presume it to possess very little resistance.

If the foregoing hypothesis be accepted as correct, we may infer that heavy-topped buildings are not only wrong in principle and useless in resisting earthquake shocks, but are also a positive source of danger. However,

Digitized by Google

before totally condemning this method of building, we must endeavour to supersede it by one more conformable to natural laws ; and as this involves a question of considerable complication, I shall put forward my ideas relating to the best form of building for combating earthquakes, with some feelings of diffidence.

In the design of such a structure I deem it necessary to prevent, as far as possible, not only the ultimate destruction of the building, but also the vibration of the earth being transmitted to it. If we can but lessen the creaking and racking which occur while an earthquake lasts, we shall, I feel assured, deserve to be well thought of by the nervous portion of the inhabitants of this country. But how is this to be effected? It appears to me that if we were to erect a very rigid building, with the base rather than the top heavy, of any material—but preferably of brick or stone—upon the surface of a sufficiently strong sheet of ice frozen, say, over a lake ; and if we suppose a moderate earthquake, composed principally of horizontal vibrations, to occur while the building was occupied, I am much inclined to think that owing to the inertia of the structure the inmates would scarcely notice the phenomenon.

Could this be shown to be correct, it would imply that the peculiar qualities possessed by this structure are the ones we should embody in all our structures. Let us inquire what these qualities are : firstly, we have a rigid building ; secondly, a level, smooth, and uniformly yielding foundation, supporting the rigid superstructure ; and thirdly, the adhesion existing between the building and the foundation is very slight, and is simply due to the friction at their surfaces of mutual contact. And it is my conviction, after some years of observation and experience, that these are the fundamental qualities which ought to be incorporated in structures for earthquake countries. Hereafter, when speaking of brick buildings, I shall intimate how these qualities may possibly be reduced to practical application.

The relative durability of timber and bricks in buildings

Digitized by Google

will now receive a brief consideration. On account of the extensive consumption of wood in Japan for structures, it may readily be admitted that the question affecting its durability should be an important one; and, yet, the Japanese, as far as I can learn, have given it no great attention. With the exception of the red stucco or plaster, seen as a coating on some of the chief temples, I know of no preservative worthy the name. Of course I am neglecting the native lacquer as it is not used on the heavy frame-work of buildings. It is well-known to experienced wood-workers that any impermeable coating, laid on wood before it is thoroughly seasoned, tends more to hasten its decay than extend its durability; as such covering imprisons the soluble ingredients of the wood, and prevents their gradual solidification by evaporation. However good such exterior coverings may be in quality, they are only effective on timber well-seasoned; and, really, when it is in that condition before being used, and placed in a favourable position, it will probably endure for centuries without any artificial coating whatever—therefore the practical value of this method is confined within moderately small limits.

It is not within my knowledge that any indigenous process exists in Japan for preserving wood, by injecting into its pores various antiseptic salts; and of all the artificial methods which have been tried, this has been the most successful—although its application is limited to certain rough kinds of work. During the last forty years, several inventors have worked at this process with the view of making it generally applicable; each one using his favourite preservatory substance. Among the substances tried have been mercuric chloride, zinc chloride, sodium chloride, copper sulphate, iron sulphate, and creosote; and the latter material, which is preferred by Bethell, has perhaps been the most generally used; for in virtue of its nauseous smell and taste, it protects the wood from the ravages of the worm, as well as coagulates the soluble contents of the fibre.

Notwithstanding all the various attempts to render

Digitized by Google

wood durable by chemical means, it may broadly be stated that no method of preservation is more generally successful than that of ordinary desiccation. But this mode requires that a period of two or three years should elapse, between the time of felling the tree and that of using the timber for constructive purposes, in order to allow the liquid matter in the tree to be dissipated, for in this matter lies the germ of decay. During this time some care is necessary to facilitate the drying, and to protect the wood from wet, and from wide variations of temperature, or it will crack and warp and be generally deteriorated. It may be well to add that while this seasoning process lasts, the capital invested in the timber is dormant, and the interest on this capital increases the ultimate cost of the timber. In order to hasten the drying, trees are often immersed in water soon after felling; as the water dissolves out and displaces the gummy resinous matter located in the cellular tissue, and when the wood is again laid dry the water quickly evaporates. This method, however, weakens the timber to some extent; but for the interior fittings of buildings and joinery in general, where strength is of small importance, wood so seasoned is very suitable for working.

It is pretty widely understood that trees should not be felled at certain periods of the year; and these forbidden periods are spring and autumn. The most usual time for felling is during winter; but I have read that in the south of Europe it is not uncommon to fell them in the summer. However, at what time soever we cut them down, it is the object to have them contain as little sap as possible; and this happens when the functional powers of the plant are comparatively inactive. In Japan, I have been informed that although recognised periods for felling are in practice; still, owing to the great demand for timber in some places, trees are often cut down at unsuitable periods when they are loaded with sap.

The organic functions of an exogenous tree are said to have a marked similarity to those of animal life: there is a double circulation of crude and elaborated sap,

Digitized by Google

which corresponds to the venous and arterial blood of the animal; a numerical and sympathetic connection between the roots and branches; and the roots may be likened to so many mouths imbibing nourishment from the soil. It follows, therefore, that the nature of the soil, in which a tree is grown will affect its vigour and healthiness; and these again affect its strength and durability. This connexion is forcibly illustrated by the sickly pines growing in the sterile volcanic soil, which skirts the bases of Fuji-yama and Asama-yama.

There are other modifying circumstances affecting the life of a tree, such as situation, etc.; but it will, perhaps, be digressive to refer to them here, as the question is properly within the domain of vegetable physiology. However, I trust, I have gone sufficiently far to point out that the durability of wood depends upon several conditions, some of which relate to the period previous to felling, and others to a subsequent period.

It is known that, in durability, different species of wood vary greatly among themselves, and, therefore, the choice of the most suitable in any given case can only be decided by trained experience. Generally speaking, the harder and the more dense the wood, and the longer the tree from which it was cut was in attaining its maturity, the more lasting it will be. Taking an example from Japanese timber, hard woods, such as *Kashi* or *Keyaki*, would doubtless be more durable than, say, *Sugi* or *Matsu*.

But, perhaps, the most important condition influencing the permanence of wood in any structure, is its position with regard to the weather. It is admitted by the best authorities that where wood is subjected to a state of alternate wetness and dryness, it will suffer premature decay, and the proof of this statement is a matter of ordinary observation; for we may often see the pillars of buildings and the piles of bridges in a state of rapid decay at the level of the ground and water respectively, while the other parts are apparently quite sound. It is my opinion that the climate of this country is extremely severe to timber, with respect to its lasting

Digitized by Google

quality; because it fulfills, in an intense degree during certain periods of the year, the last named condition of decay. When the summer rains occur in June and July, we have often an alternation of rain and sunshine, and an oppressively humid atmosphere, which, I consider is exceedingly trying to the endurance of wood.

Another noteworthy feature entering into this subject refers to the age of the tree, with regard to its maturity. If the tree be felled before maturity we get an inordinate amount of sap wood, and comparatively little heart wood: on the other hand, should it be cut down too long after maturity, we find the heart wood in a state of decay, showing that the living functions are entirely located in the sap wood. This blending of health and decay, may be seen to advantage in some of the aged and majestic pines forming the splendid avennes on the Rei-hei-shi kaidô and Ôshiu kaidô leading directly to the historic shrines of Nikkô. In these avenues may be seen many instances of large trees in an active state of growth, while the trunks of them are simply thin shells with rotted interior surfaces.

Having now reviewed in a summary manner the principal conditions touching upon the durability of timber, brief reference will be made to a serious question which bears immediately upon the consumption of wood for any purpose whatsoever. I allude to the subject of deforestisation. The direful experience or famine, resulting from drought, recently borne by nighbouring countries ought certainly to convey a solemn lesson to the Government of this country, and prevent the indiscriminate removal of trees in fertile districts. As this matter has been recently ventilated by the foreign press, in several articles giving seasonable admonitions to the responsible authorities, it is but necessary here to show its connection with the question being considered.

In treating of wood buildings it would be a grave omission to overlook the durability of wood in its relation to fire. It is incontrovertible that towns composed mostly of wood buildings are more liable to fires than

Digitized by Google

those where brick or stone buildings are predominant. This difference is not only in the number of fires, but also in the extent of the damage resulting from them. Perhaps there are few cities in the world that can afford more forcible examples of the lamentable loss of life and property incurred by this destructive element than the city of Tôkiyô. In some cases—and several have occurred within the last few years—we know that the houses and property, and often some of the residents, of a large and populous district are reduced to ashes by an insubduable conflagration. And we read of the same disasters in other cities where wood buildings prevail. As recent examples, may be cited Chicago and Quebec.

The suitability of brick and stone for buildings in this country will now be summarily considered, as I have already given as much attention to the leading properties of timber as can be admitted on this occasion.

The use and manufacture of bricks in this country, on a noticeable scale at least, is, I believe, quite of recent origin, and has occurred since the advent of foreigners. We therefore cannot expect the Japanese to be largely experienced in the arts of brickmaking and brickláying; but, considering their brief acquantance with these trades, I think it must be generally allowed that the work, already accomplished by them, reflects the greatest credit upon their manipulative skill. Nevertheless, they have something yet to learn in the art of making good bricks, and still more in the art of bricklaying in its most general sense.

With that imitative power which indubitably is a striking feature in the Japanese character, they have made bricks which externally appear equal in quality to European-made bricks; but judging from some experiments and from observation, I am led to believe that native bricks are very faulty in the qualities of compressive resistance and impermeability; and this evidently results in a large measure, from unskillful burning. The proper burning of bricks is a nice operation, involving considerable tact and experience; for if not sufficiently burnt, they are soft

Digitized by Google

and porous and comparatively worthless; and if overdone they vitrify and become disfigured so as to be practically useless for building. Japanese bricks generally err in the former way, by being insufficiently burnt, and are therefore weak and extremely porous. This porosity exhibits its effects in the dampness of buildings, and in their crumbling away by the action of frost.

The mortar, or other cementing material, used is, in many cases, inferior also. This inferiority, in the case of mortar, generally arises from the use of old or poor fatty limes, and unclean sand intermixed with earthy or loamy material. The dampness of the bricks, due to their porosity, will prevent the mortar made from fat or non-hydraulic limes from setting; as it is known that such limes will not set under water, and may even be wholly dissolved away by successive portions of water.

With respect to stone as a building material, little need be said, as I believe its extensive use to be more a question of transport than anything else. Both in Tôkiyô and Yokohama a soft perishable stone, of recent formation is much used; but there is a serviceable stone known as "Blue Idzu"—because it comes from the province of Idzu—which is likewise largely employed. Regarding more durable stone, such as granite or other igneous rocks, as I have just said, I think its more general employment depends mostly on the ease of transportation and working, as it may be had in quantity in various parts of the country. I recollect noticing some fine granite being quarried on a small scale in the vicinity of Kiyôto, on the road leading from that city to the summit of a mountain called Hiyeisan overlooking Lake Biwa.

As we cannot reasonably expect a superior structure made from inferior materials, it is necessary to decide whether or not the bricks and stone and the mortar in a building are of good quality; before we attempt to institute comparisons with wood buildings with regard to the leading conditions we require. And I entertain the opinion that few really good brick or stone buildings exist in the coun-

Digitized by Google

try. There are many structures, it is true, pretending to this character, but the most of them are lacking in essential qualities. I might instance the composite buildings of wood and stone commonly erected in Yokohama and Tôkiyô, and we may see that after a few years existence they are rapidly on the way to decay and require constant repair. Their non-liability to take fire is more fancied than real: and yet this mongrel system of building, or one in which tiles and plaster replace stone, is now being largely used by the government for the numerous departmental offices in Tôkiyô and other places.

It appears to me a pity and a great mistake, that the chief buildings in the capital of an empire should be of such a flimsy and gimcrack description. Not to speak of dwelling-houses and religious edifices for the present, it is certainly my belief that buildings connected with the legislative, judicial, and executive functions of a nation, should not be erected for years merely, nor even decades, but for centuries. What better embodiment of art and civilisation can we transmit to posterity than such public structures, surrounded, as they doubtless will be, by historical associations of a nationally interesting character? What more truthful record have we of the splendour and high civilisation of the once noble Greeks, or of the victories and greatness of ancient Rome, than the mute history told by the remains of their national structures? The Acropolis at Athens, the Colosseum at Rome, the Pyramids and Sphinx in the valley of the Nile, and the numerous classical remains which stud the coast of Asia Minor, are lasting monuments of the greatness of the people that built them.

In this country, as indeed in most countries both ancient and modern, the choicest buildings are devoted to the purposes of religion; and, in truth, we can say that the finest and most durable structures in Japan are its temples of wood. But how does their durability compare with the temples of stone seen in other countries—for example the Athenian temples? The oldest wood building I have seen or know of in Japan, is the *furui*

Digitized by Google

mon or old gateway which forms the approach to the massive bronze idol of Tôdaiji at Nara, on the border of the province of Yamato. It is now in a propped-up and dilapidated condition, and the Bonze cicerone at the temple told me its age was twelve hundred years. However, chronological data from this source may justly be accepted with some reserve ; but allowing this to be its correct age, it is only about half that of the Parthenon in the Athenian Acropolis ; and although this queen of temples is now a classical ruin, still, as an architectural authority has said, "so gently has the hand of time pressed upon this venerable edifice, that the first impression of the mind in beholding it is doubt of its antiquity."

Examples might be cited from Roman works, completed more than twenty conturies ago, to prove the durability of brick structures ; but they are probably unnecessary, for it will be easily granted that brick and stone are far more lasting, and therefore more suitable, for sumptuous and important buildings at least, than wood placed under the most favourable circumstances. If we consider the strength of brickwork we shall find it similarly satisfactory, providing it is united with good cementing material—and, especially so, if well bonded with painted hoop-iron. The cohesive resistance of brickwork, with hoop-iron bond, was decisively shown by Brunel in 1835, when he succeeded in constructing two half-arches of brickwork projecting 40 feet from each side of a single pier without any end supports whatever.

As I have already given so much attention to the qualities of strength, stability, and durability, there is little opportunity left for any lengthy notice of the remaining division of the subject ; and probably this is not necessary, as the three qualites just referred to are the principal ones connected with the earthquake considerations of a building.

The question next to be discussed is whether a Japanese house possesses the properties of comfort and convenience; and in order that the good of the greatest number may be primarily considered, it may be well to treat the matter

Digitized by Google

from a Japanese rather than from a foreign point of view, In doing so, we may presume that the social life of the Japanese has less regard for privacy than ours ; and that generally, their faculties of smell and feeling are also less acute. Indeed, reasoning from observation, I am inclined to aver that, in some cases, native sensibility is so indifferent as to bear a range of temperature, which would cause a frost-bite at one extreme, and a violent fever at the other to a European, with the utmost nonchalance and want of bad effect.

Most foreigners, who have experienced them, have expressed their admiration of Japanese dwelling-houses during the summer season, on account of the pleasant coolness they afford ; for generally every breeze, however gentle, can waft its welcome way through them. Even if the light sliding doors be closed, the paper which covers them is so permeable as to diffuse, more than prevent, any current of air tending to enter the interior. While concurring with the generally favourable opinion of native dwellings as summer residences, my opinion is that the distinctive feature conducing to this pleasantness while living in them in summer is that which renders them extremely unpleasant in winter. The quality which makes them the charm of summer, and the misery of winter, depends upon the simple fact that "they let in the cold." I am not referring now to the semi-European houses with glass substituted for paper in the sliding-doors and windows ; but to purely native dwellings where glass is not used. During winter the shelter afforded by the thin porous paper which surrounds the rooms is a mere apology as a screen from the inclemency of the weather. The heat, emanating from the brazier of glowing charcoal, is quite local ; and only serves to render the pervading chill more tangible by warming one part of the body while the rest is subject to shivering. My personal experience of Japanese houses during winter, is that the only means of obtaining comfortable warmth is by getting beneath the ***kotatsu*** ; which it is almost superfluous to remark, is composed of a wooden frame standing

Digitized by Google

over a brazier of glowing charcoal, and supporting a large quilt or coverlet, under which you neglect the dignity of attitude to satisfy the cravings of comfort by reclining below its folds with only the head visible.

With regard to the convenience of native dwellings, perhaps, little can be said but what is favourable when the social wants and customs of the Japanese are considered. Since they set no special value on privacy, and have a proclivity or fondness for intercommunion and social intercourse, the temporary partition generally seen dividing the rooms, may be considered a convenient arrangement. There is one trait, however, which is noticeable, in Japanese hotels especially, that is not consistent with European notions of convenience, however it may be with Japanese, and that is, the most elegant and commodious room is frequently in such close proximity to a certain quarter of the premises as to make it extremely offensive to sensitive olfactory nerves. When we view this feature in connection with the question of health, it becomes the more objectionable: especially during periods when cholera and other miasmatic diseases are prevalent.

In attempting to draw comparisons between the comfort of native dwellings and in foreign style houses of brick it is only just to select a brick-house containing the full improvements known to the modern architect: probably few such exist in Japan. Many brick structures designed for dwellings may be seen, it is true, but in most of them, I believe, the questions of ventilation, warmth, and good sanitary conditions have been either neglected or not understood. In some cases, where air-holes for ventilating purposes are inserted, they are often misplaced by putting the inlet at the bottom of the room and the outlet at the top instead of in the inverse position. This erroneous arrangement of these apertures is plausibly supported by the fact that heated air tends to ascend, and consequently it is often held that the outlet should be near the ceiling. But provided that the heated air escapes into the atmosphere at a superior height than the cold air enters, it matters little where the ventilating orifices are

Digitized by Google

situated. It is stated that the first important application of this principle of ventilation, was made by Major Webb about forty years ago, in the Pentonville prison. By this disposition of the air-holes we prevent the cold draughts due to the incoming current, by causing the fresh air to diffuse with, and absorb heat from, the heated air of the room as it decends. Vitiated air in rooms may originate and foster cholera, fevers, and other serious diseases: but cold draughts of fresh air, arising from improper modes of ventilati on, are also inimical to health, by causing colds. rheumatism, consumption, and bronchial ailments.

The quantity and temperature of the air admitted is also a matter deserving consideration on the score of health, and will be governed mostly by the purity and temperature of the surrounding atmosphere. According to good authorities, a temperature ranging from 63° to 66° Fah. is the most suitable: and a volume of air, from 15 to 20 cubic feet, is required per minute for each person.

An indispensable question connected with the relative comfort afforded by Japanese dwellings and brick houses in foreign style, is the respective methods used for producing artificial warmth; and this question should be scientifically dealt with. It need not be said that the Japanese use open braziers with charcoal fuel and no chimnies; the Europeans have an open fire-grate or stove with a chimney. Owing to the permeable nature of Japanese paper, the pernicious carbon di-oxide evolved from the burning charcoal, may diffuse away through the paper without being damagingly felt; but to put the same brazier into a closed dwelling room with brick or plaster walls would be criminal, if not resulting from ignorance. Yet it would be easy to point to brick houses here where no provision exists to carry off the gases evolved.

In a European house there is probably no method more healthful and cheerful, but at the same time more wasteful, than the open fire-grate. Approximately only one-eighth of the calorific value of the fuel is obtained for warmth—the remaining seven-eighths going up the chimney, but this latter is exceedingly effective in promot-

Digitized by Google

ing ventilation. On account of this ventilative action, and because of the feeling of cosiness and comfort engendered by the blazing fire of an open-grate, they will long be received with favour, in spite of their want of economy.

These considerations tend to show that brick houses embodying comfort and warmth in winter, and freedom from injurious draughts at any time, are quite unsuited to be warmed with open braziers without chimneys. If such dwellings are to be used in Japan—and with slight modifications in details on the foreign style, to meet earthquake phenomena, they are the kind I would strongly recommend—we ought to accept the European house *in toto* with all its perfection of details; as any hybrid construction is neither comfortable nor convenient when viewed in relation with health, It is my opinion that few, if any, Japanese occupants of brick houses have experienced the valuable qualities inherent in a well-built and correctly-designed brick dwelling, because the majority of those now erected are wretchedly defective in almost every essential condition, besides exterior form, from the fact that the ventilative and sanitary arrangements have been partially or wholly neglected.

Seeing this it would not be surprising if the Japanese after a trial of such defective dwellings left them with a derogatory opinion of brick buildings altogether, and returned to homes built in their own style which at least have no lack of ventilation.

In treating of the qualities conducing to the comfort and convenience of dwelling, I have already considered the hygienic part of the question to some extent, as regards ventilation and warmth; but there are other agencies tending to make a healthy home besides those alluded to—one of these is the question of light which is thought an important one by some medical writers; but looking at the small windows in some of the brick houses in this city it must be allowed that this element has insufficient provision.

The principal features favouring health in dwellings

Digitized by Google

are, perhaps, good drinking water and efficient sewerage. When infectious diseases like cholera are rife, the greatest impediment to their progress at present known is in having wholesome water to drink and in preventing the noxious smells evolved from decaying animal or vegetable matter. It may be said without much fear of contradiction that the open drains bordering most of the streets in Japanese towns and taking their loathsome trail under the threshold of most of the dwellings, do not fulfil good sewerage conditions; and it may also be be positively affirmed that the open wells in the streets, supplied mostly by surface water percolating through soil loaded with putrid and excrementitious matter, do not satisfy our notions of wholesome drinking water.

When we analyse this subject, and take into account that upon the health and vigour of the inhabitants individually, depends the health and vigour of the nation collectively, it must be granted that this question of the healthly homes of the country, is one weighty with grave and momentous considerations. And it affects the women more than the men of the community, because the time of the former is spent more indoors.

The providing of dwellings with efficient sewerage and good water accommodation cannot be accomplished without great expense; but it is a necessary expense—more necessary than that incurred in sumptuous buildings or ornamental parks, and of more direct advantage to the country. The method of providing towns with water is so commonly understood as to need no special description. Premising that the source is pure from which the water is taken, the only difficulty to be overcome, is to convey it to its destination without its suffering in quality—and the permeable aqueducts used in this country do not fully effect this object.

The best material for such conduits is cast-iron with the interior surface coated with pitch or other suitable substance; and the quicker the authorities can afford metallic water-mains the better for the people.

The sewers should also be made of impermeable mate-

Digitized by Google

rial and situated underground. They should be provided with suitable fittings, as stench traps, etc.; and be made to discharge their contents far from the "busy haunts of men," where there is no possibility of their returning.

The only condition remaining of those premised at the commencement of this paper is that of architectural beauty. And, since connoisseurs do not always agree on all points, when reviewing this subject; my remarks thereon will partake much more of personal thoughts and reflections than the dissertations of an æsthetical critic.

The poet has said that,

"A thing of beauty is a joy for ever,"

and if this be true, then, it at once shows that things of beauty should be made of durable material. As we are dwelling upon the architectural beauty of buildings, in this case, it tells us that structures possessed of beauty, should also be lasting or the joy they engender will not last for ever.

Authorities define beauty as an assemblage of qualities that excite our admiration and our pleasure; and it may be said that of all the architectural specimens this country affords, none draw our admiration more than its temples. The ordinary dwelling houses with their sombre exterior of unpainted wood can have no claim to beauty, I think; and the edifices of the former nobles cannot compare in this respect to those pertaining to religion. Therefore these remarks will be confined to the architectural beauty of the native temples. It is, perhaps, universally admitted that the flowing curved roof with its stately and ornate ridge; the enormous eaves clad in gilded metal; the richness of panelling and carving; and the luxuriance and harmony of colour, which are seen in the better temples excite our admiration and are, therefore, elements of beauty—even though this beauty be unique and grotesque. My reflections, however, favour the idea that the grandeur of these edificies is one of glitter and immensity rather than of grace and sublimity; and the ornamentation of them seems to lack that apparent utility, and fitness to an end, observable in Grecian or Roman

Digitized by Google

architecture. There is a saying that "the height of art is to conceal art," and this concealment of art under the apparent form of usefulness is strikingly noticeable in foreign architectural art. While simply existing for the purposes of embellishment; columns appear to support a massive entablature and superstructure; and corbels, brackets, pilasters, arches, and festoons seem laden with a purpose which has more the semblance of utility than ornament. This you find in foreign design; but in my opinion, there is an absence of this subserviency of art to utility in Japanese architecture.

My feelings are that the structural material of which the native temples are formed detracts in some degree from their beauty, because of its comparative want of durability; for the sentiment arising in the mind from their contemplation is tinged with sadness by notions of decay. With regard to native architectural beauty, my conclusions are that its claim to this quality is due more to luxuriance of colour, elaborateness of small details, massiveness, and tinsel glitter, than to correctness of proportion and apparent fitness of purpose; and will never compare with the chaste and affecting beauty of those architectural ruins which now lie, where once it could be said

> "On the Egean shore, a city stands
> Built nobly."

As the leading conditions taken up have each been discussed separately, it may be convenient to reduce these remarks to a general conclusion, embracing the various points that have been considered. In speaking of the condition of strength it was asserted that the Japanese method of building is very crude in principle and exceedingly wasteful of material, and that if strength be considered with respect to economy of material they are certainly much inferior in strength to the framed structures of wood adopted in foreign countries. In order to improve native wood buildings in this respect I would recommend the truss principle, and a more liberal employment of wrought iron connections at the joints. With regard to their stability either for resisting typhoons or

Digitized by Google

earthquakes my opinion is that they possess that quality in an insufficient degree ; and that this absence of stability is due to the want of diagonal members in the framing and to a heavy roof. In passing over durability, I have endeavoured to demonstrate that wood is not the most suitable material for the dwellings of settled and staid communities ; because of its rapid decay and inflammability—and more especially does the remark hold good in the case of national buildings, possessing beauty and historical interest. As the three qualities of strength, stability, and durability are those of the greatest importance in arranging suitable buildings for combating earthquake phenomena ; it is scarcely necessary to reiterate anything on the remaining conditions premised ; and I will now revert to brick buildings and state my opinion of the qualifications they possess, and the modifications they require to suit them for this country. I have already mentioned my conviction that a structure to resist and palliate earthquake shocks should have cohesive strength and rigidity, and not flexibility ; and that the centre of gravity of the whole should be as low as is consistent with design. Also, that the substructure or foundation should be level and uniformly yielding, and have the slightest possible connection with the superstructure. It is quite likely that no motion would ensue between the substructure and superstructure except in an extraordinary earthquake, and in such an event if the structure possesses sufficient inherent coherence and rigidity, it might move relatively to the earth without suffering much damage.

I think the shock to the nervous system induced by an ordinary earthquake, is due more to the creaking and rocking motion of a flexible house than the vibrations of the ground ; and to palliate this nervous shock is one reason why I prefer rigid to flexible buildings. This view is supported by the fact that earthquakes which are severely felt indoors, are often not noticed by persons outside—showing that the motion of the earth simply is far less apparent than the motion of a flexible house.

Digitized by Google

When the materials and workmanship of a brick or stone structure are of good quality, I believe they embody the conditions I have assumed necessary almost to the full extent. Authorities on building allow that a uniformly-yielding is superior to a rigid foundation; and as generally in practice foundations are completed and allowed to harden before the superstructure is put on, we have in the ordinary course of things a practically level and equally yielding substructure, corresponding to our ideal one of ice. Then, it is common to have the basement walls thicker than those above them, and thus the centre of weight is kept low—and for the sake of economy, as low as possible. And lastly, as to cohesive strength and rigidity, a brick building may be made to possess these qualities in a great degree. By interlaying in the work a liberal quantity of hoop-iron or bolts and cramps, and by using old English band, a very strong wall could be made. I would recommend that the plan of the building should be a simple geometrical figure—a circle by preference, although this figure is not often consistent with design—and the use of properly formed arches over any but narrow openings, instead of lintels. My opinion is that a brick or stone building of good quality possessing these features, would be found to resist a serious earthquake without suffering a crack.

Of a number of native designed brick dwellings at present erected in this country, I have a decidedly unfavourable opinion, as they seem to me to be very defective in the qualities constituting a healthy, convenient, and durable dwelling. The use of an open brazier for producing warmth in winter must make the air in them hurtful in the extreme, on account of their defective ventilation.

There are, however, a few examples of brick and stone structures in Tôkiyô by foreign architects which might be copied by native builders with advantage, and which in my opinion are excellent, both in the taste and principle of design and in durability and fitness for their intended purpose. The best of these belong to the Government

Digitized by Google

and include such fine and solid buildings as the Paper Mill and the Kobu-Dai-Gakkô—buildings that are in themselves at once a proof of the confidence their architect has in brick and stone for an earthquake country, and of his professional courage and ability. For it must be remembered that really these structures are a grand experiment, as such a lofty and spacious edifice of brick and stone as the main hall of the Kobu-Dai-Gakkô is for the first time erected in this country ; and in making such buildings the designer to a great extent stakes his reputation on the confidence he has in his design, and in the materials he employs. Their architect, I need hardly say, is Mr. de Boinville.

In the course of these remarks I have disputed the advantages of the native method of building to some extent ; but I have done so upon purely technical grounds and not from national prejudices, and to support this statement I could, if necessary, mention features of Japan of a social and industrial character, which I believe are more worthy of being commended than their buildings are of being condemned.

Digitized by Google

Digitized by Google

ASIATIC SOCIETY OF JAPAN.

A General Meeting was held at the Grand Hotel, Yokohama, on the evening of Saturday 11th May, the Chair being taken by Mr. J. J. Keswick, Vice President.

The Recording Secretary announced that at a Council-meeting held on the 4th May Mr. Arthur Winstanley had been elected an ordinary member; and also that at the same time it had been decided that a Special General Meeting should be held in Tôkiyô on the 18th May for the purpose of adopting a revised code of Rules.

Mr. George Cawley then presented a paper entitled "Some remarks on Constructions in Wood and Brick and their relative suitability to Japan" which in view of the paucity of members present was, on the motion of Dr. Eldridge seconded by Mr. Holtham, taken as read.

On behalf of Mr. Ayrton, who had already perused the paper, Mr. Mondy handed in the following note:

Mr. W. E. Ayrton desires to state that he is glad to see that Mr. Cawley advocates the principle that it is not always the most rigid foundations that are the best for Japan. In a short article on Structures in an Earthquake Country published a few weeks back in the *Japan Mail* by Mr. Perry and himself, and a copy of which he desires to offer to the Society, it was advocated that if the lower parts of a structure had appreciable times of vibration the earthquake shock would be altered in character, lengthened in time, and therefore diminished in intensity before it reached the upper parts of the buildings. Consequently, if small stones or bricks set in common mortar were the building materials employed it was better to choose, for the site, a quaking bog, which was capable of supporting the weight of the building, rather than to build the house direct from a rocky foundation; or if the ground was firm then it was stated that there ought to be placed underneath the house a foundation of yielding timber, or some other method should be sought for by means of which the time of transmission of momentum through the joints might be increased. This sentence he learns has produced a little astonishment in the minds of some of the engineers of this country who rather object to the principle that a bad building ought to have, what may be called, a bad foundation, but in reality it is on this principle that spring-buffers are attached to railway carriages to deaden the shock, and another simple example of the practical use of this principle has come to his notice during the last few days on a visit to one of the men-of-war in the harbour. Formerly the barometers were damaged by the firing of heavy guns on board ship, but now the transmission of momentum from the ship to the barometer is lengthened and the mercury prevented from knocking out the top of the glass barometer tube by suspending the barometer not

Digitized by Google

directly from the ship, as of old, but from a long wooden slowly vibrating spring.

In the article in question in the *Japan Mail* it was proved that the period of vibration on a conical mountain one hundred feet high and with a base one hundred feet in diameter was about one-tenth of a second, and that the period was directly proportional to the height. Building then a house on a hill is a very practical method of causing the lower parts of a structure to have an appreciable time of vibration. This may be the explanation of the fact that while during the great earthquakes the lower parts of Tôkiyô suffered so much damage, the higher districts at Uyeno, Surugadai, etc., escaped with comparative freedom; also why earthquakes are occasionally experienced in the settlement of Yokohama which are unfelt on the Bluff.

At the meeting of the German Asiatic Society held towards the beginning of this year Dr. Naumann exhibited a chronological chart of earthquakes, volcanic eruptions, atmospheric disturbances, sea-waves, sun-spots, and shooting stars which he had compiled with a vast amount of labour from the Japanese records during the last twelve hundred years. This he was so kind as to lend to Mr. Ayrton for a short time. In the accompanying chart, which he sends as being probably interesting to the Members present Mr. Ayrton has had Dr. Naumann's results plotted on a slightly different scale from that adopted by this gentleman, and in addition he has entered the points corresponding with the data given subsequently by Mr. Hattori in his paper on Destructive Earthquakes in Japan read before our own Society. This chart enables us to compare at a glance the results given in the two compilations, and it is interesting to see how closely the chronological tables contained in Mr. Hattori's paper agree with those previously published by Dr. Naumann.

Mr. Mondy at the same time presented a copy of the pamphlet "On structures in an Earthquake Country" and the Chart alluded to in the above note.

The Chairman thanked Mr. Cawley for his valuable and interesting paper and expressed his regret that, owing to various circumstances, the audience had been less numerous than he had anticipated, and than the merits of the paper deserved.

The meeting then separated.

Digitized by Google

NOTES ON SOME OF THE VOLCANIC MOUNTAINS IN JAPAN.

BY

D. H. MARSHALL, Esq., M.A.

Read before the Asiatic Society of Japan, on the 27th April, 1878.

In treating of volcanic mountains a difficulty at once arises, viz., how to divide them into classes. There are active, dormant, and extinct volcanoes, and it is frequently very difficult to say to which of these divisions any particular volcano belongs. But as my object is merely to read a few notes of general interest on some volcanoes of which I have acquired some knowledge, I must leave to the writer of an exhaustive geological paper to enumerate and classify all the volcanoes in Japan.

1. Fuji-yama.*

Fuji-yama or, as it is more commonly called by the Japanese, Fuji-san is situated on the boundary of the provinces of Suruga and Kai, and is the highest mountain in Japan. The first eruption of this princely peak is said to have taken place in 285-6 B.C., when, it is recorded in Japanese books, Fuji was raised and lake Biwa sunk in one and the same night. But for reasons given by Mr. Hattori at the last meeting such a date cannot be depended upon. Other recorded dates of eruption are 799, 864,

* *Yama, san, take*, are the common Japanese words for mountain

Digitized by Google

936, 1031, 1082, 1649, and 1707.† These will be found recorded in the Nihon-gi and Sansai-dzuye. In the Nihon-gi it is written that in 799, the summit of Fuji burnt and emitted showers of ashes with thundering noises. The waters of the rivers at its base became red and at night brilliant flames were seen. Again, in the San-sai-dzuye, it is recorded that in 864 the flames rose from the summit of Fuji to a great height. There were frequent earthquakes, and the sea for a distance of 30 *ri* along the shore receded 2 *ri*, large quantities of fish perishing.

The last eruption of 1707 (4th year of the period Hôyei) is however the best known. Just as a great earthquake shook the provinces of Suruga and Tôtômi a great fire was seen between the Sumoto and Ashitaka yama (these are the two ridges which mar the very regular shape of Fuji), which spread hot ashes like rain. The sound of this eruption was heard at Yedo 30 *ri*‡ distant, whilst the ashes were carried as far as the provinces of Shimôsa, Kadzusa, and Awa. At this eruption the hump Hôyei-zan was formed and was so named after the period in which the eruption took place. It is the well-known hump on the south side of the mountain. Last autumn I ascended it and found its height to be 9,400 feet. Just below it Fuji curves more gracefully and smoothly than in any other part of the mountain and the view of this portion from the summit is very much admired by the natives.

Kæmpfer in his history writes of Fuji, "Sometimes a black stench and smoke is observed to issue out of the top of the famous mountain Fuji, in the province Suruga, which in height is surpassed only by the Peak of Teneriffe, but in shape and beauty hath I think not its equal. The top of it is covered with everlasting snow, which, being, as it frequently is, blown up into flocks by the violence of the wind, and dispersed about, represents, as it were, a smoking hat. The Japanese histories mention

† For these dates and others contained in these notes I am indebted to Mr. Inomata, Librarian of the Kobu-dai-gakkô, and to some students of the same college. Although I cannot vouch for their being absolutely correct, I believe them to be approximately so.

‡ 1 *ri* = 2½ miles approximately.

Digitized by Google

that formerly the top of it burnt, but that upon a new opening being made by the violence of the fire at the side of the mountain, the flame ceased soon after."§ It is quite possible that in this last sentence the eruption of 1707 is referred to, for it answers exactly to the formation of Hôyei-zan, and, although Kæmpfer left Japan in 1692, his History was not ready for the press till 1712, and it is well known that till the end of his life he kept up a correspondence with the foreigners in De-shima, so that in his history quotations from letters are found which were sent from Japan many years after he had left that country. In the year 1707 also, it may be interesting to note that an island called Black Island was formed by a submarine eruption in the bay of Santorin.

It is common, but I think erroneous, to speak of Fuji as an extinct volcano. It has been dormant for not more than 170 years, but the world-known Vesuvius itself is known to have been dormant for periods comparable with this, e.g. prior to 79 A.D., between 79 and 203, and between 203 and 472. Again Scrope writes, that during the quiescent interval between the eruptions of 1139 and 1306, the whole surface of Vesuvius was in cultivation, and pools of water and chestnut-groves occupied the sides and bottom of the crater, as is at present the case with so many of the extinct craters of Etna, Auvergne, etc., (see Scrope's Volcanoes, chap. III). Fuji is therefore better called a dormant volcano.

It is interesting to note the similarities of this volcano to others better known, such as Vesuvius or Etna. Thus it has at its base five lakes, all seen from the summit, viz., Nebara, Nishi, Motosu, Kawaguchi, and Yamanaka the two last being of considerable size. We might include Hakoné lake as one of the Fuji lakes, although it is separated from it by a ridge. Again Fuji like other volcanoes has several subsidiary elevations, such as Hôyei-zan, Omoro-zan, the gracefully hemispherical hills Futatsuzaka, etc. Lake Hakoné, like Avernus, it is thought,

§ Scheuchzer's translation of Kæmpfer's History, London, 1727.

Digitized by Google

may be an ancient crater. Ô-jigoku and Ko-jigoku—the Great and Little Hells—may be classed as solfataras. Ô-jigoku lies on the side of Kammuri-ga-také which adjoins Soon-san, another mountain constantly emitting sulphur fumes, like the Great Hell and its smaller neighbour. shewing that the fires beneath are by no means extinct. Possibly the geyser at Atami has its source in the same fiery pit.

I have just said that lake Hakoné it is thought may be an ancient crater. It is interesting to compare this with what Kæmpfer, in the description of his journey to the Court of the Shôgun in 1691, wrote regarding the lake which he passed on March 11th of that year. He wrote: "This lake is everywhere surrounded with high mountains which shut it up on both sides in such a manner, that there is no room to apprehend its overflowing the adjacent country, Though the mountains which encompass it be of a very great height, yet the top of Fuji-yama rises still higher being seen to the W.N.W. by the inhabitants of Tôgitsu.‖ We were told that in former times this place sunk in by a violent earthquake, and that in lieu of it sprung up this lake. In proof of this they advance the great quantity of sugi or cedar trunks of an uncommon size which lie at the bottom, and are fetched up from thence by divers, when the lord of the place commands it, or hath occasion for them. For the neighbourhood produces everywhere great plenty of this tree, and the tallest and finest cedars that are to be found anywhere in Japan. The lake of Tôgitsu or Hakoné, being entirely surrounded with mountains, hath no other outlet but through one of these mountains, being the same which is called Futago-yama, and which lets the water come through three different openings from whence they fall down the mountain side in the nature of cataracts to a considerable height, and, soon receiving other rivulets from the neighbouring mountains, form themselves into a river which with a frightful horrid noise crosses the valley, running down over stones and sometimes precipices towards the sea."

‖ This was the name formerly given to the village of Hakone.

Digitized by Google

It is quite evident from what follows that he refers, in the last sentence quoted, to the Haya-kawa ¶ which flows through the Miyanoshita valley and which is really the outlet of the lake. It is also certain that his description of the lake and its outlet was obtained from enquiries from the inhabitants of Hakoné (where his party stopped to dine) and the neighbourhood, for, as he himself tells us, he would never be allowed to leave the high road through which his guards escorted him. Now it is very probable that he was led into the error regarding the connection between the lake and the Haya-kawa by the people telling him of an artificial outlet which the farmers on the other side of the mountains to the west of the lake made in order to secure water for their fields in all seasons. This is a tunnel piercing the mountains, and is an engineering work of great magnitude and requiring great skill for its execution. On visiting the mouth of the tunnel with some friends in August 1876, Dr. Veeder estimated the flow at that time to be approximately 3,200 cub. ft. per min., quite a formidable rival to the natural outlet. However, this artificial outlet had a gate to regulate the outflow.

Fujisan lies in a hollow entirely surrounded by mountains, except where it makes one grand sweep to the Suruga gulf. Over these surrounding mountains its snowy peak can be seen in all directions. In walking round the base in the winter of 1876 with my colleague Mr. Dixon we were much struck with this curious feature in the situation of Fuji, and Mr. Dixon very appropriately compared it with a coral island. Coral islands are said to have this formation, and strange to say have been supposed to be of vol- canic origin. The base of Fuji is cultivated to a height of from 1,000 to 2,000 feet. On the S.W. side I have seen growing at a height of 1,000 feet, tea, tobacco, rice, millet, maize, beans of different kinds, sweet potatoes (*Satsuma imo*, and *sato imo*,) *kimi*, *morokoshi*, *mitsumata* or the Suruga paper plant, etc. Above the cultivated portion there is a

¶ *Kawa* is the Japanese for river.

Digitized by Google

belt of varying breadth of what might be described as prairie ground (*hara*), and above this is the vast belt of forest which encircles the mountain for half its height. In this forest there is a great variety of trees including coniferous trees of various kinds—cryptomerias, pines, firs etc., chestnut, elm, *dzusa*—a tree from the leaves of which oil is extracted, maple, alder, willow, boxwood, *kokusagi biyofu, osemi, yamahari*, etc. Above the forest is the bare lava cone where no plant is found except a curious plant called *nikuji*, which is said to be found in the sand and rocks above the forest, and is supposed to cure diseases.

There are four roads to the summit, viz., from Yoshida, Subashiri, Suyama, and Maruyama. The Yoshida road is the easiest to ascend by, the Subashiri to descend by. The number of roads leading to the summit of such a high mountain, each of them containing about ten mountain huts where the pilgrim can rest himself or even sleep when night overtakes him, is an indication of the great reverence that the Japanese have for their kingly mountain. One of the most interesting sights to the foreigner who has reached the summit is the praying of pilgrims to the rising sun. I have seen two or three hundred of these white-robed devotees turn out of the numerous sheds on the summit and chant their prayers most melodiously to the rising ruler of the day. The collection of huts on the summit is situated chiefly on the east side of the crater, and might be said to form a little village with ever-changing inhabitants. Indeed, the last time I was there with some friends, to our utter amazement our passports were asked for by a most respectable officer of the law, and, what perhaps was as strange, we all had brought them up with us!

From the summit of Fuji on a clear day the view is superb, of mountains, lakes, rivers, valleys, plains and seas. Away to the west are the lofty Akiha-san in Tôtômi and On-také in Shinano, the latter second in height only to Fuji itself amongst the mountains of Japan, towering as it does to the height of 10,000 feet; to the east of north is Asama-yama sending forth its accustomed cloud, while to

Digitized by Google

the N.W. are seen the lofty rugged and evidently volcanic peaks of Yatsu-ga-také and Koma-ga-take. Sometimes these high mountains are hidden by stormy seas of snow-white cloud, but even then the mountaineer feels the splendour of the scene ample reward for his labour. The height of Fuji it is well known has been very carefully determined by Mr. R. Stewart, late of the Survey Department, by an omnimeter, to be 12,365 feet above high water mark at Numadzu—a number easily remembered when we consider that 12 is the number of months, and 365 the number of days, in the year. Even at this great height it is easily calculated that we can see little more than the $\frac{1}{1000}$th part of the earth's surface. The crater was descended by Mr. J. Rymer Jones, and found to be 500 feet deep.

I have only one other remark to make on Fuji, viz., that I have long thought that on account of its very regular conical shape, its isolated position, rising as it does on one side from the sea itself, and its enormous mass, it would be a splendid mountain on which to repeat Maskelyne's Schehallien experiment to determine, by measuring its attraction, the mass of the whole earth. The chief difficulty, as was pointed out to me by Professor Tait of Edinburgh, is its volcanic character. On account of its being a volcano it will be difficult to determine with certainty its approximate mass. If the geologists in the Society could give us the means of measuring the mass approximately it seems to me that it would be well worth the trouble of the physicists, aided by their students, to undertake this great work.

2. Asama-yama.

Asama-yama, the greatest active volcano in Japan, is situated between the provinces of Shinano and Kôdzuke. Its height is 8,500 feet. The earliest eruption of which I have been able to find a record is that of 1650, given in the Asama-yama-tai-hen-riyaku-ki. After this eruption it was only feebly active for 133 years when there was a terrible outburst, viz. that of 1783. It seems to have taken

Digitized by Google

place on August 1st of that year.* The eruption was first felt at Kusatsu where, it is said, the waters suddenly became so hot that many bathers perished. Sand, mud and blocks were thrown out of the mountain, and so thick were these that the country for a great distance around was in darkness during the day time. Some of the stones, thrown as far as Oi-wake, are said to have been so large that 2 persons could not carry them. Earthquakes and great noises accompanied the eruption; 43 villages were destroyed, and many men and animals killed. Some rivers became dry, others overflowed their banks, causing great damage. Half the village of Daizen was carried away by the lava.

It is interesting to read that in the same year there were several disturbances in other parts of the earth. Amongst these were the earthquake shocks in Calabria. In May of that year the island of Nyoë near Denmark was formed, but lived only for a year. In June there was a fearful eruption of Skaptar Jokul in Iceland, when lava was vomited out sufficient to form another Mont Blanc. In January of the following year also there happened remarkable subterranean thunders at Guanaxuato in Mexico.

Only eight years ago (1870) there was a considerable emission of volcanic matter from Asama-yama, at which time, also, violent shocks of earthquake were felt in Yokohama, and in Oaxaca in Mexico.

Two years ago I read before the Society a short account of an ascent of this mountain, made in the summer of 1875.† Since then I ascended the mountain with two companions from Kariyado, on the opposite side from which I climbed it before. We took horses for 3 *ri* to Wakasari-no-chaya, after which we had to climb on foot. There is no water to be got between this house and the summit

* See Titsingh's Japan for a full account of this eruption.

† I might here take the opportunity of correcting a mistake in the account referred to above. The date of the last great eruption of Asama is there stated to be 1871 instead of 1783.

Digitized by Google

(although plenty of snow is found on the top in the crevices of the old crater), and, as there is no protection all the way up from the scorching sun, it is well to carry water from this tea-house. The road, however, is by no means difficult of ascent, the lava being of a size convenient for walking on. Some distance up the road unites with that from Hanada—the way that those come who ascend from Kutsukaké. We were very fortunate at the top to get a good view down the crater, for the whole of the vapour cleared out for five minutes. The crater was, however, too deep, and we were too little acquainted with the nature of the edge, to venture near enough to see to the bottom. The irregular rocky walls were of a sulphury character and had many holes belching out sulphurous fumes. The greatest quantity of vapour, however, apparently came from the bottom. We descended to Oi-waké, the road most frequently taken both in ascending and descending, and which is very much more difficult than either of the others. It has one convenience, in passing a cool well a long way up the mountain. What are called the "Blood-pools," which may be passed this way, are very insignificant pools of water with red clay bottoms. The red torrent and fall close by are interesting. The water has a strong taste of iron, a deposit of the oxide of which evidently gives the red colour to the clay. Professor Mondy tells me that he analyzed a dried specimen of the clay, and found that it contained upwards of 37 per cent. of iron. The deposit, he adds, is interesting, because it illustrates how deposits of iron may be formed. The clay he suggests has been mixed with water, which has percolated through the porous masses of rock higher up the mountain, and dissolved out the compounds of iron contained in them, and that by subsequent action of the atmosphere it is oxidized and deposited as seen. Professor Mondy also observed a red clay similar to the above at intervals, in passing down the Usui-tôgé‡ which he thinks might be traced to the same pools.

---

‡ *Tôgé* = mountain pass.

Digitized by Google

8. Shirane-san.

One day's journey from Asama is another most interesting volcano not at present active, but evidently recently so. It is called Shirane-san and is yet known only to a few foreigners. There are two mountains, which from having the same name and being not far distant from each other, are constantly confused, even by the Japanese. These are Shirane-yama, which lies on the borders of Kôdzuke and Shimotsuke, and is ascended from the Chiuzenji Yumoto, and Shirane-san, which lies on the borders of Kôdzuke and Shinano, and is ascended from the high mountain pass which crosses from Kusatsu to Shibu, and is a very striking object in the scenery on the road. I ascended it with three companions in July, 1876. The upper part of it is quite bare and of a yellow-red colour. When we reached the summit we were agreeably surprised to find two small lakes occupying two craters; the nearer looked black, the further turquoise blue, bordered with crystalizing sulphur. Indeed, beyond the blue lake there is another small crater, but with only a little rain water in it. The black lake we found to be 90 feet, and the blue one 140 feet, below the highest point, which we found to be 6,500 feet above the sea-level. On the summit many sluggish wasps and dragon-flies found means of living. In the middle crater there were three huts, used by the natives who occasionally come here to collect the sulphur. The largest of these contained some simple arrangements for separating the sulphur from the clay with which it is mixed. Prof. Atkinson on his return home found the clay to contain about 75 per cent. of sulphur. In walking over this sulphur clay we had to be very careful, for we sunk considerably, and the more the nearer we approached the lake. This volcano might perhaps be classed with the sulphur-mud volcanoes of South America. The middle crater was particularly interesting, both on account of the beautiful blue lake with yellow margin, and the many coloured volcanic rocks which rose above it. The blue

Digitized by Google

water was somewhat acid and chalybeate, and from the mountain a stream flowed highly impregnated with alum and iron. At the place where this stream crossed the mountain pass, 'Doku-midzu' or 'Poison water' was engraved on a rock.

4.—Shirane-yama

The other Shirane which I ascended last summer is still smouldering. There was a violent eruption of this volcano, when all the trees on the mountain were burnt, only six years ago, viz, in June, 1872; in April of which year also Vesuvius was in eruption. Many charred stumps and half-burnt trees are still to be seen. The lava cone is quite isolated and distinct, and to it alone can the name be applied. The crater has a very irregular shape and contains several depressions full of rain water. At the bottom of a fearful rent, reaching to the foot of the cone, there is a pretty blue lake called Goshike-no-ike, above which the cone rises to a height of 1,200 ft. The height of the summit above the sea level is about 8,500 ft. and above Yumoto 3,800 ft. At this great height many swallows (*iwatsuba*) were flying about the rocks of the crater. The trees on the mountain, as well those half-burnt as not, were principally *takekamba* or *yamakamba* (mountain ash), but there were also many large pines (*matsu*) and cryptomerias (*sugi*) with sprinklings of maple and *dodansui*, with its pretty red flowers. The ground, except on the cone, is covered with the broad-leafed bamboo grass (*kumagazasa*), and rhododendrons (*shakunage*), while at the base of the mountain are found many rare plants, amongst others the delicate *Yukifurisô*. A species of this plant is called in America the Indian Pipe. The path, by which the mountain is ascended, passes over the summit of another mountain, called Mayeshirane, before the real cone is reached. This, as well as the great steepness and roughness of the path, makes the ascent one of considerable fatigue, much worse than that of its sister peak Nantai-zan. The Japanese think that Nantai-zan is the highest peak in the Nikkô region, but in this they are, I think,

Digitized by Google

wrong, for I found that the summit of Shirane-yama is just as high above Yumoto lake as the summit of Nantai-zan is above Chiuzenji. Yumoto being nearly 700 feet higher than Chiuzenji, the one summit is the same amount higher than the other. The summit of Maye-shirane was 700 feet lower than that of Shirane-yama. In our ascent, which took place in the middle of July, we passed snow 900 feet above Yumoto.

A common characteristic of volcanoes is the presence of natural hot baths at or near their bases. Thus we have the hot baths of Ashinoyu, Ubaga, and the Hayakawa valley near the base of Fuji, those of Kusatsu, Sawatari, etc., near the bases of Asama and Shirane-san, those of Yumoto, Shionoyu, etc., near the base of Shirane-yama, and so on through nearly all the volcanic centres. The village of Yumoto is quite impregnated with sulphuretted hydrogen, which at first is odious, but, as in chemical laboratories, one soon gets so accustomed to it as not to perceive it. The chief source of the hot sulphuretted water is surrounded by a strongly built tank, to look into which is apt to call up very unpleasant thoughts of how a tyrant like the Inquisition might treat its helpless victims. From this tank the water is led in small aqueducts to the different baths. Curious little worms are found here, which live on the banks of the little streams of hot water bubbling out of the ground, and whose existence, apparently, depends upon the heat, if not upon the ingredients of the water. Indeed, it is noticeable that while water impregnated with sulphur is poison to fish it is by no means so to the lower forms of amphibious animals. Thus frogs and leeches abound on the margin of Yumoto lake. The sulphury character of this most picturesque lake is well seen at its outlet, where the water falls over rocks blackened with sulphury slime, at an angle of about 40°, and forms the beautiful white foamy Yu-no-taki,§ by far the most beautiful of the waterfalls of Nikkô. Again Chiuzenji lake into which the

§ *taki* = waterfall.

Digitized by Google

water of Yumoto lake flows, is said to contain no fish, although frogs abound, and I am told leeches and salamanders are not uncommon. I am not, however, satisfied that the nature of the water is the cause of the absence of fish in this large beautiful mountain lake. Its water is quite pure to the taste, it is as clear as crystal, and the bottom is perfectly clean. Bathing in it we found particularly pleasant, and the pebbly beach admirably adapted for that purpose. The absence no doubt is partly owing to the outlet Kegon-no-taki being a high waterfall, up which no fish can rise.

The height of this waterfall Prof. Smith and myself found by an aneroid to be approximately 260 ft., which is only one-third of what the natives of the place have hitherto believed to be the real height. How they got the number 75 *jô*‖ which they regularly gave to visitors as its height, it would be interesting to know. We found, however, that a stone took 5 seconds to fall from the top of the waterfall to the river below, shewing that the stone was retarded for a whole second by the resistance of the air in falling through this height.

Regarding Kæmpfer's idea that the outlet of Hakoné lake was through Futago-yama, such a condition of things is by no means impossible in a volcanic region such as Hakoné is. The stream between Chiuzenji lake and the waterfall above alluded to is (roughly guessing) about 500 yards long, but when the level of the lake is low, and the outflow therefore small, the water disappears entirely before it flows over half the bed of the stream, and there is then no waterfall at all. The water on account of the great porosity of the ground simply sinks beneath the bed of the stream and oozes out of the ground again half way down the great chasm, over which the stream falls when the outflow from the lake is great, forming myriads of little streams which reunite again at the bottom of the chasm to form the rapid Daya-gawa. Those who have visited the very beautiful Silver Thread Fall—Shira-ito

‖ 1 *jô* = 10 ft. nearly.

Digitized by Google

no-taki—at the base of Fuji-yama, can easily understand how this takes place. At such a time to cross and recross the gushing torrent, which one must often do to ascend Chiuzenji-tôgé, and thereafter to examine its origin, adds much to the entrancing pleasure which every lover of scenery must feel when he nears this romantic region. It was simply because there was no waterfall at all that my friend and myself were able so easily to measure its height.

5. Nantai-zan.

From the margin of the sacred waters of the lake Chiuzenji rises the holy mountain Nantai-zan. This might almost now be called an extinct volcano, for traces of a crater are hardly visible, although in other respects it is quite volcanic in character, the top *e. g.* being quite covered with scoriæ. I think it might be classed with such mountains as Chimborazo, Ararat, and the Puy de Dôme which Humboldt distinguished as 'unopened domes' or 'bell-shaped elevations without craters', but these are now thought to be extinct volcanoes with traces of a crater obliterated. The fact that trees are growing on the summit of Nantai-zan shows that it has probably long been inactive. Its height has been found to be 3,800 feet above the lake, or 7,800 feet above sea-level. From the summit there is a most magnificent view of Fuji-yama, Asama-yama, and the snow-clad mountains of Shinano as well as of the whole Nikkô range.

6. Iwawashi-yama.

The next volcano I shall briefly describe is Iwawashi-yama or Ganjiu-san. Mr. Clark of the Kôbu-dai-gakkô, who climbed this mountain last summer, has placed at my disposal a few notes he then took. He tells us that this exceedingly interesting mountain lies about 18 miles to the N.W. of Morioka the chief town of Nambu. When travelling northwards viâ Tona one can see its sharp cone at least 12 miles before reaching Morioka, and it is very prominent amidst the surrounding mountains. To reach it from Morioka jin-riki-shas can be taken for 10 miles to a

Digitized by Google

village called Suzuki-ishi. From this village to Nishini, whence the mountain is ascended, is a distance of four miles of very bad road. Several streams must be forded, but this part of the road is made interesting by many small conical hills rising abruptly out of the boggy plain. These indeed are quite similar to the conical eruptions around the Jorullo in Mexico. From Nishini horses can be taken for about four miles, after which it is necessary to climb on foot. The mountain is now seen to be the last peak of a small chain and does not present such a fine appearance as when seen from beyond Morioka. The path, which is composed of clay, rises rapidly through a wood, and, in consequence of being traversed by numerous pilgrims is so worn down and narrowed at some places that there is scarcely room to walk, and to make matters worse a series of rude steps are formed which are very irregular and slippery. After about two and a half miles the path breaks out on to the cone which consists of huge masses of lava and scoriæ. From this the ascent is easier and at times good views can be obtained of the surrounding country. Upon arriving at what is taken for the summit it is found that this is merely the edge of a crater, out of which springs another fine symmetrical cone, consisting almost entirely of scoriæ. When this second cone is ascended the pilgrim finds himself on the edge of another crater out of which rises a third cone which also has a crater. This innermost crater seems to have been recently in action, and is still smouldering. It is lined with huge rocks overlapping one another in all directions, and as each of these has a different colour, derived from the intense heat to which they have been subjected and subsequent weathering, the whole of the innermost crater as seen from the edge of the middle crater is a sight alone worth the trouble of ascending the mountain. In walking around the edge of the middle crater sulphur fumes are seen issuing from one side, and if it be entered hot air and sulphur fumes can be seen and felt issuing from several crevices. From the edge of this crater, which is about 6,300 feet above sea level, on a clear day there is a fine view of the northern end of this island

Digitized by Google

and the surrounding ocean, including the sea of Japan, the straits of Tsugaru, and the Pacific.

There are many other volcanic mountains in the main island, but I have been able to get very little information about them beyond their positions. The following list, beginning with the most northerly, contains the principal of these, which are either active or dormant.

7.—Osoré-san in Riku-ô or Mutsu is a peak of a ridge called Yaké-yama, now dormant. On the opposite side of Awomori bay from this volcano rises Iwaki-yama or the Tsugaru-no-Fuji, the latter name being derived from its Fuji-like shape, a shape possessed by many mountains in Japan, and which are all most probably extinct volcanoes. In Ugo also rises the lofty Fuji-like Chôkai-zan which Mr. Gubbins in the Notes of his trip from Awomori to Sado calls a volcano. In the native geographies it is said to be the highest mountain in the old province of Déwa, to the summit of which pilgrimages are made to worship the Chôkai Gongen.

8.—Bandai-san in Iwashiro, now dormant. This is the most prominent peak of the mountains surrounding the plain of Wakamatsu, the old castellated capital of Aidzu. About one *ri* from the picturesque ruins of the castle is the bathing village of Yumoto, delightfully situated in a charming valley.

9.—Nasu-yama on the borders of Iwashiro and Shimotsuké. This volcano has been already briefly described by Captain Descharmes in the Transactions of the Society, Vol. III, part 2. When passing in its vicinity last summer I lodged with a friend at Kawajiu, a hamlet at the mouth of the valley of the Igari-gawa. Here there are hot baths on the brink of the river, and hot water bubbles up from the bed itself so that one can plunge into warm water and swim into cold and vice versa. There are many other bathing places around the base of Nasu-yama.

10.—Yaké-yama, a lofty rugged peak in Yechigo. When I passed this mountain three years ago, the inhabitants of

Digitized by Google

the district told me that it was then in action and was periodically so.

11.—Miyôkô-san, also in Yechigo, is the highest mountain for a great distance around and forms a very prominent peak in the scenery in the descent of Kusatsu-tôgé on the Shibu side.

12.—Taté-yama, a very lofty volcano in Yetchiu, now dormant.

13.—Haku-san, or Shira-yama, a dormant volcano situated on the borders of the provinces of Kaga and Hida. It is said to have been in eruption in the years 1239 and 1554, since which time there have been hot springs at its base. It is a lofty mountain with much snow on it even in the hottest part of the year, whence probably its name.

14.—Ô-yama in Sagami. This mountain was in action in 1853.

Mr. Brunton in his map calls Ôdai-yama (called also Ôdai-ga-hara-yama) on the borders of Yamato and Kii an active volcano, but Captain St. John who has given a most interesting and full description of this mountain in the Society's Transactions, and from whose account Mr. Brunton has evidently taken the height 5,400 feet, does not say anything of its being a volcano.

We now come to the volcanic islands stretching to the S. E. of the province of Idzu, called by the Japanese Idzu-no-sho-tô.

15.—The largest and nearest to the mainland of these is Ô-shima (Vries Island). According to the Idzu-kai-fu-dô-ki, Mihara-yama in this island has long been known to be a volcano and is still quite active. A great eruption is said to have taken place in 1684 which lasted 7 years (till 1690), and a still greater eruption in 1777 (in which year also there was a violent eruption of the mud volcano at Macaluba in Sicily). The latest eruption took place January last year and this is still going on although not violently. Only four weeks ago I saw it sending up a cloud quite equal to that of Asama-yama. Mr. Atkinson who formed one of a party who chartered a steamer to visit the island during this last eruption has supplied me

Digitized by Google

with the following notes of the ascent then made. He tells us that Habu on the S. E. of the island has a very picturesque appearance and is evidently an old crater, for the sides rise precipitously from the water and nearly meet at a narrow opening through which it communicates with the sea outside, the rocks are volcanic, and the soil has that peculiar colour which is characteristic of decomposed lava. Further the inhabitants stated that about 100 years ago, the sea broke through the crater and formed the harbour as it now exists. This corresponds exactly in time to the very great eruption of 1777 when most probably the event happened.

In describing their ascent of the volcano he says: "The road along which we travelled in making the ascent of Miha-ra-yama, 2400 ft. high, was for some distance rather pretty, being under trees at a considerable elevation above the sea, and the sides of the road luxuriating in numerous ferns. By and bye, however, the character of the road changed when we came within the region of the lava streams, and very hard work we found it jumping from one stone to another, each of which had been brilliantly polished by the denuding action of heavy rains, during which no doubt these lava streams will be converted into raging torrents. When we left these streams the roads were almost equally bad, being ravines about 12 ft. across at the widest part, and bullocks, which are the chief beasts of burden and are used to carry wood from the mountain to the shore, formed along with the rains curious pathways out of the soft tufa which forms the principal rocky matter in the island. Add to this that the trees on each side stretch across the path shutting out almost all light, and you will have a sufficiently vivid conception of the tunnels through which we had to pass. After a time we left these tunnels only to find another lava stream to be ascended and this one proved of considerable difficulty. In many places it seemed to have flowed over waterfalls and thus left almost vertical walls, to get to the upper part of which required all our ingenuity. Finally we emerged from this and

Digitized by Google

found ourselves at the foot of the mountain proper. When we got to the top of the first ridge we saw that it was necessary to walk for a considerable distance along the edge and we looked down into an immense abyss evidently an old crater inside of which the more recent ones had been formed. On this ridge we came upon a bed of fossil leaves (chiefly alder) apparently the remains of vegetation suddenly destroyed by a shower of ashes which had subsequently been removed by denudation. That this was a probable explanation was borne out by the discovery of a vertical hole filled with a soft brown substance, probably the decayed trunk of a tree which had experienced the same fate as the leaves. After a little further walking we found a place where we could descend from the ridge of the outer crater and cross the plain leading to a more recent one. When we reached this it rained heavily so that only at intervals the interior of the crater could be distinguished. The sides were almost vertical and very rugged, whilst every here and there a column of steam issued forth giving a weird effect to the whole. The new crater in process of formation was at the bottom of this older one, the molten lava having found a weak place in the floor. Every two or three seconds the heaving liquid was burst by the pressure of the steam in the pipe and an immense eruption of red hot lava the result. The lava ejected in a red hot state rapidly became black on the outside as it was subjected to the cooling influence of the air, and after having been projected to a varying height would fall back again either into the inside of the new crater or on to the outside of the new ridge, thus shewing the process of formation, which though described in books with sufficient clearness, must be seen to be thoroughly appreciated. The ring of the crater was not quite complete. At one end it appeared to have been broken away and we saw that if we could get round the ridge on which we were standing, so as to be in a line with the longer axis of the new crater, we might be able to see the bottom, and observe more minutely what took place at each erup-

Digitized by Google

tion. With considerable difficulty, from the violence of the wind and the existence of big holes, we made our way to this point and there saw the great cauldron of boiling and heaving liquid which at every opening was covered with cloud and smoke and at the same time gave rise to a great explosion. The outside of the new cone appeared quite black and cold, but in the interior the walls were red hot, as we could see every now and then when a portion gave way and fell into the lava pool. As to the height of some of the eruptions they must have been about 1,000 feet.

Earthquakes are never felt on the island and a rather severe one felt in Tôkiô during our visit, was not felt by us."

It is noticeable here that in speaking of the matter throwu out of the crater, Professor Atkinson makes no mention of flames. The flame mentioned by the Japanese in their accounts of volcanic eruptions is most probably what is usually mistaken for flame, viz., the reflection of the glowing lava from the clouds of matter ejected from the crater. For other accounts of this eruption see the *Japan Weekly Mail*, New Series, Volume I, No. 4, and the Geological Magazine, May 1877.

16.—In Miyake shima, the largest of the Idzu-no-shotô between Ô-shima and Hachijô there is according to the book above referred to, a place called Yamabukisawa which broke out in 1711 and this eruption continued till 1713. In 1763 and 1769 there were also eruptions but the place is again overgrown with plants. There is also a mountain called Otoko-yama of which there was an eruption in 1874.

17.—In Hachijô-jima, next to Ô-shima the largest of these islands, and used in former times by the Shôgun as a place of correction for insubordinate nobles, there is according to the same treatise a high mountain called Nishi-yama which is said to have been raised by a great eruption in the 15th century. It was again in action in the 16th. On the summit there is a crater of great size and depth with walls quite precipitous and containing water.

Digitized by Google

From resembling Fuji-yama in shape it is often called the Fuji of Hachijô. Another name for it is Koshiké miné.

The Shôguns seem to have chosen a place calculated to impress the recalcitrant nobles, for, according to Kæmpfer, "This island, besides being washed by a rough tempestuous sea, is so well guarded by nature itself, that when there is some provision of the common necessaries of life or some new prisoners to be brought in, or the guard to be relieved, the whole boat with all the lading must be drawn up and let down again by a crane, the coasts being so steep and rocky as to admit of no other access."*

There are many other mountains on the mainland which are extinct volcanoes, such as Miôgi-san in Kôdzuke, Sengen-yama in Idzu, Yatsuga-také with lake Suwa at its base on the borders of Kai and Shinano, etc., etc. To enumerate them all would I believe practically amount to taking in the whole island as one grand volcano.

Yezo.

In the island of Yezo there are eight active volcanoes;

1.—Iwo-san, or Itashibeoni, situated on the boundary of Kitami and Nemuro.

2.—One of the two peaks Oyakan San and Meyakan in Kujiro.

3.—Iwafu nobori † or Iwanai nobori in the province of Shiribeshi.

4, 5, 6.—Tarumai-také, Nuburibetsu-daké, and Usu-také in Iburi.

7, 8.—Komayé-také and Té-san in Toshima.

Besides these an island lake in Kusuri to the west of Mashiro-yama in the province of Kujiro, Ôoshima a small island to the west of Toshima, and Riishiri an island to the S. W. of cape Soya, are said to be actively volcanic.

* Since writing the above Sir Harry S. Parkes has informed me that it is now thought by Japanese scholars that Kæmpfer's account of this island, and more especially as to its being a penal settlement exclusively for nobles is incorrect.

† *Nobori* means hill.

Digitized by Google

For a short account of these volcanoes and their geological connection with other volcanic cones in the island, I must refer to Mr. Lyman's Report on the Geology of Yezo, published last year by the Kaitakushi. In the Transactions of the Society, Vol. II, also there will be found an account of the ascent of Koma-ga-také made by Captain Bridgford.

Amongst the Kuriles, or as the Japanese call them, Chi-shima, there are said to be 8 or 9 volcanoes, but it is difficult to find any trustworthy information regarding them.

Kiushiu.

In Shikoku it seems that there are no active volcanoes, although Mr. Hattori has informed us that earthquakes and hot springs are not uncommon, but in Kiushiu there are several very active ones.

1.—Tsurumi-také to the north of Yufuga-také in the middle of Bungo.

2.—Aso-také, N.E. of Kumamoto in Higo. This is said to be the highest mountain in Kiushiu, and its southern slope is very steep and rugged. It is said to be the volcano into the crater of which the Christian proselytes were thrown if they refused to renounce their faith, during the severe persecution carried on against them in the last century. At the end of the 17th century Kæmpfer wrote that 'there was an almost perpetual flame issuing out of the top of this mountain.'

3.—Onsen-ga-také (called in many foreign books and maps Wunsen) is situated in Hizen near Shimabara in the peninsula of Takagi Kôri. There was a terrible eruption of this volcano in 1793, in which year also one of the salses of Taman on the N. W. extremity of the Caucasus had an eruption. Titsingh, who left Japan in 1784, was then living in India and there received a graphic account of this eruption sent to him from Japan. There seems to have been eruptions of three contiguous peaks, within three months, as well as some alarming earthquakes. The last eruption was the worst, concerning which

Digitized by Google

Titsingh writes that just before the mountain burst into action, several houses beyond the castle (of Shimbara) were engulfed with their inhabitants, prodigious rocks rolled from the mountain, overthrowing and crushing everything that happened to be in their way, and tremendous subterranean noises resembling loud and repeated discharges of artillery were heard. The sea inundated both the town and country, and at the same time an enormous quantity of water issuing from the clefts of the mountain met the sea water in the streets and produced whirlpools, which in some places washed away the very foundations of the houses. The castle alone remained uninjured, because the water could not penetrate its strong massive walls, while several houses near it were so completely destroyed that not one stone was left upon another. The number of those who are known to have perished exceeds 53,000.

Siebold writes that this was the first recorded eruption for 1,000 years, but although it may have been the first very violent eruption within that period, still the volcano was in an active state 100 years before that, for Kæmpfer in his History, writes of this mountain. "Onsen is a deformed large but not very high mountain near Shimabara. At all times the top of it is bare, whitish from the colour of the sulphur, and withal resembling a *caput mortuum*. I could discern the smoke arising from it at three miles distance. Its soil is burning hot in several places, and besides so loose and spongy, that a few spots of ground excepted, on which stand some trees, one cannot walk over it without continual fear, for the cracking hollow noise perceived under foot. Its sulphurous smell is so strong that for many miles round there is not a bird to be seen; when it rains, the water bubbles up, and the whole mountain seems then as it were boiling." Regarding the many hot springs at the base of the volcano it is amusing to read what he writes, "The monks of this place have given peculiar names to each of the hot springs arising in the neighbourhood, borrowed from their quality, from the nature of the

Digitized by Google

froth a-top, or the sediment at bottom, and from the noise they make as they come out of the ground ; and they have assigned them as purgatories for several sorts of tradesmen and handicraftsmen, whose professions seem to bear some relation to any of the qualities above mentioned. Thus for instance they lodge the beer and saké brewers at the bottom of a deep muddy spring, the cooks and pastry-cooks in another which is remarkable for its white froth, wranglers and quarrelsome people in another which rushes out of the ground with a frightful murmuring noise, and so on. After this manner imposing upon the blind and superstitious vulgar they squeeze large sums of money out of them, making them believe that by their prayers and intercession they may be delivered from these places of torment after death." Siebold estimated the height of Onsen at 4100 ft.

4.—Kirishima-yama in Ogata Kôri, south of Hiuga. There are two peaks called east and west Kirishima, of which the west is continually giving forth sulphur fumes. Kirishima-yama is higher than the surrounding mountains and along with Aso-yama and Hidehiko-yama forms a range called the walls of Kiushiu.

5.—Mitaké in Sakura-shima which lies in the gulf of Kagoshima is also an active volcano. There were violent eruptions of this volcano in 1828 coincident with some severe earthquakes which extended to the mainland.

6.—Iwô-ga-shima or the sulphur island which lies to the S. W. of Satanomisaki is also always smoking. Kæmpfer gives rather an amusing account of the first exploration of this island. He writes "The greatest quantity of sulphur is brought from the province Satsuma. It is dug up in a small neighbouring island, which from the plenty it affords of this substance is called Iwô-ga-shima or the sulphur island. It is not above 100 years since they first ventured thither. It was thought before that time to be wholly inaccessible, and by reason of the thick smoke, which was observed continually to arise from it, and of the several spectres, and other frightful uncommon apparitions, people fancied to see there chiefly

Digitized by Google

in the night, it was believed to be a dwelling place of devils, till at last a resolute and courageous man offered himself, and obtained leave accordingly, to go and to examine the state and situation of it. He chose 50 resolute fellows for this expedition who upon going on shore found neither hell nor devils, but a large flat spot of ground at the top, which was so thoroughly covered with sulphur, that wherever they walked, a thick smoke issued from under their feet. Ever since that time this island brings into the Prince of Satsuma about 20 chests of silver per annum, arising only from the sulphur dug up there, besides what he gets by the trees and timber growing along the shore."

In Riukiu there are two actively volcanic islands, viz. Suwasé-shima and Tori-shima.

I should like to offer as an apology for presenting to the Society this imperfect list of the volcanoes of Japan, the very sparse knowledge which is even yet to be found in English books on the subject, and the unintelligible names that are generally given to those volcanoes referred to, a difficulty which can be easily overcome, now that the spelling of Japanese words in Roman letters is nearly uniform. I shall only say in conclusion that it is obvious that the whole of the Japanese Empire stretching from the Chi-shima through Yezo, the mainland, Kiushiu, on to the Riukiu islands, contains one continuous range of volcanic mountains. In Ō-shima to the east of Idzu we have learned that the volcano there is sufficient to protect it against earthquakes, but in spite of their being many such safety valves on the mainland and adjacent islands we unfortunately cannot, after having crossed wide oceans to reach this Land of the Rising Sun, boast of having yet found terra firma.

Digitized by Google

NOTE ON THE AMOUNTS OF SULPHURETTED HYDROGEN IN THE HOT SPRINGS OF KUSATSU.

By Edward Divers, M.D., F.C.S.,

Professor of Chemistry, Imperial College of Engineering, (Kôbu-dai-gakkô) Tôkiô.

In the latter part of July 1876 I visited Kusatsu with others, among whom were Professor Marshall, and Professor Atkinson of the Tôkiô Dai-gaku. There, in conjunction with Professor Atkinson, I made observations to determine the amounts of sulphuretted hydrogen in the hot springs. Captain Descharmes read before the Society some notes on these waters October 22nd 1873, and the Mittheilungen of the German Society, part X, July 1876, contains chemical analyses of these waters, by Dr. Martin. The results of my observations I beg to lay before the Society as an appendix to Professor Marshall's paper on Volcanic Districts.

The sulphuretted hydrogen was estimated in a quarter liter of the hot water by means of a standard iodine solution. The apparatus and chemicals were carried to the springs and the operations executed upon the water with the utmost rapidity, so as to avoid appreciable loss of the gas. An imperfection in the procedure adopted was the performance of the operations upon the *hot* water. By some experiments made in my laboratory with the same iodine solution and quarter-liter quantities of distilled water of about the same temperature as the hot waters of Kusatsu, I have endeavoured to eliminate the errors due to this cause, and the quantities I believe to be correct

Digitized by Google

within five per cent. and therefore sufficiently so, considering the smallness of the quantities.

In ten thousand volumes of water we found

	Temp.	*Sulphuretted Hydrogen gas.*
Netsu-no-yu, ...	64·5 C.	29 volumes.
Jizo „	63 „	24½ „
Goza „	66° „	26½ „
Taki „	66° „	33 „
Nagi „	46° „	37½ „

These are hot springs in the centre of the village. The principal stream entering the village is at first cold, though mineralized water, but as it passes on it receives near Sainogawara on its right bank, small springs of hot, hepatic water. In several of these we determined the sulphuretted hydrogen, and found it even much less than that in the central springs, namely, from only 5 to 12 volumes per ten thousand volumes of water.

For the sake of comparison I add that the once celebrated waters of Harrogate in England contain 196 volumes in ten thousand.

Digitized by Google

Digitized by Google

ANALYSIS OF THE SWEET POTATO.

BY

B. W. DWARS, Esq.

During the months of February and March of the present year three kinds of *Satsuma Imo*, the tubers (*tubera rhizogena* of *Batatas edulis* with varieties of the same) commonly called "Sweet Potato," were analysed at the Shiyakujo in Ôsaka, in order to extend our knowledge of the value of Japanese food products.

The tubers offered for analysis were of last year's growth (October 1877).

1.—A large *white* kind, grown in this province (*Setsu*), in the village of *Kota*, in the district (*Kôri*) of *Kata*.

2.—A *red* kind of a middling size, grown in the province of Iyo, *Naka shima; Kami-no-uramura*.

3.—A *red* kind of a middling size,—very sweet (called in Ôsaka *Boke-imo*), cultivated most likely in the same quarter as that marked (2) above.

As sweet potatoes (especially the red kinds) are subject to rapid decomposition, the quantity of water contained in these was as soon as possible determined. A sample of each kind, weighing about 500 grammes, was then dried and reduced to a fine powder. These powders were afterwards analysed as stated below. According to Payen, who has examined the sweet potato cultivated in America and France, it contains only cane-sugar; but the powders

Digitized by Google

which I have analysed contain a considerable quantity of sugar as *glucose*. In the analyses the sugar is reckoned as cane-sugar.

ANALYSES.

	No. 1.	*No.* 2.	*No.* 3.
Water	75·50 per c.	75·20 per c.	69·10 per c.
Ashes.....	1·09 „	1·35 „	1·07 „
Fat.....	0·29 „	0·26 „	0·39 „
Albumen	1·02 „	0·92 „	0·84 „
Sugar	5·19 „	5·82 „	8·42 „
Starch	14·70 „	14·20 „	12·30 „
Extractive matter	1·82 „	0·93 „	3·51 „
Cellulose, etc.....	1·39 „	1·32 „	4·37 „

Although the analyses of the three kinds show that their substances, especially of the 1st and 2nd differs very little from each other, still the Japanese prefer the white which is more to their taste.

26th March, 1878.

Digitized by Google

ASIATIC SOCIETY OF JAPAN.

A General Meeting of the Society was held on Saturday, 27th of April, at the Tôkiyô Shoseki-kuwan, Sir Harry S. Parkes, President, in the chair.

The Minutes of the last meeting in Tôkiyô having been taken as read, the Recording Secretary announced that Mr. E. G. Holtham and Mr. O. Keil had been elected members of the Society. The Corresponding Secretary presented some "Analyses of Japanese Sweet Potatoes" communicated by Mr. Dwars, of Ôzaka, which were taken as read.

The President presented the draft of the new rules drawn out by the Council, which, on the motion of Mr. Chaplin, were laid on the table.

The Library Committe directed attention to certain books which had been weeded out from those forming the Society's Library, and which were offered for sale to the members.

Mr. Marshall then read "Notes on some of the Volcanic mountains of Japan."

As an appendix to this paper, Mr. Divers gave an account of his examination of the mineral waters of Kusatsu.

Mr. Satow thought that Japanese dates could not be ascertained to within a year, for as no comparison of Japanese dates with their European equivalents existed for more than fifteen years back, it would be impossible to give the date according to the European calender without making troublesome calculations. Mr. Marshall had spoken of the height to which vegetation grew on the side of Fuji-san; in an ascent he had made last summer he had found plants growing as far as the seventh station, and had seen tufts of grass even af for as the ninth. The *kaba* to which Mr. Marshall had referred, he thought was probably a birch.

Dr. Veeder remarked that Asama-yama could be seen from several points in Tôkiyô, and he had on several occasions seen the volcano of Ôshima from the artificial hill in Kaga Yashiki. He also referred to the roar heard on Asama-yama, and compared it with the sound of the Geysers in California.

Mr. Bramsen said that there had been published a table comparing Japanese dates with those given in European calendars, so that when the Japanese year period was given, the exact European equivalent could be ascertained.

Mr. Dixon said that on the summit of Fuji-san there were eight peaks which had been likened to the eight petals in the flower of the Lotus, and suggested that that might have had some influence in confirming the popular belief in the sacredness of the mountain.

Digitized by Google

Mr. Smith had taken great interest in the mode of production of the sound heard on Asama-yama and in other craters. He had had the advantage of seeing the crater of this mountain while it was perfectly free from cloud, and had felt that the sound was merely made up by the jets of steam which could be seen issuing from the sides. The sound exactly resembled that of the Solfataras at Hakoné. Mr. Smith also referred to the curious fact of the existence of insects at the very top of Asama-yama, and in the very worse parts, even flying right over the crater from which the poisonous volcanic gases were issuing.

The President said that the interest felt in the paper had been shown by the discussion which had taken place, and he thought that it would be of advantage if some of the mountaineers who were in this country, would give the Society some account of their experiences. He thought that in all probability Mr. Smith's explanation of the sound heard at Asama-yama was the correct one. He had also been so fortnate as to see the crater when it was perfectly free from vapour, and he seemed to be looking into perfect darkness—there seemed indeed, to be no bottom. He was inclined to consider that for the same height, the difficulty of the ascent of Asama-yama was greater than that of Fuji-san, for there was no beaten track, nor were there any resting places. He proposed a cordial vote of thanks to Mr. Marshall for his very interesting paper.

The President further said that, as it was already so late it would be unfair to Mr. Cawley to have his paper read then, and suggested that it should be postponed till the next meeting.

The meeting was then adjourned till the 8th of May.

Digitized by Google

AN EXAMINATION OF THE EARTHQUAKES

RECORDED AT THE

METEOROLOGICAL OBSERVATORY, TÔKIYÔ.

BY

W. S. CHAPLIN, Esq.

Read before the Asiatic Society of Japan, on the 22nd June, 1878.

—o—

From an examination of a large number of earthquakes Professor Perrey of Dijon has concluded that they are more frequent when the sun and moon are in conjunction and opposition, than when they are in quadrature; more frequent at conjunction than at opposition; more frequent when the moon is in perigee, than when in apogee; and more frequent when the sun and moon are on the meridian than at other times.

To see whether these conclusions hold good concerning the earthquakes of Japan, I have drawn up the accompanying tables, which are based on the records published by the Surveying Department of the observations made at Yamato Yashiki. These records were commenced in July 1875. I have reduced the observations made from that time until January 1878, thus including 143 earthquakes. In three cases the records are ambiguous, but I have taken the times which seem to be the ones intended.

Digitized by Google

Tables I, II and III contain, in the first column, the number of each earthquake in the year ; in the second, the month ; in the third, the day, hour and minute mean time ; in the fourth, the distance of the sun in sidereal hours and minutes east or west of the meridian ; in the fifth, the same distance for the moon ; in the sixth, the moon's distance east or west of the sun in sidereal hours and minutes ; in the seventh, the distance of the sun south of our zenith in degrees and minutes ; in the eighth, the same distance for the moon ; in the ninth, the time in hours and minutes to the nearest perigee.

Tables IV. V, VI, VII, VIII, IX are drawn from tables I, II, and III in order to make the results more clear.

Table IV shows the position of the sun east or west of the meridian. Earthquakes have been most frequent when the sun was two hours east and eight hours west of the meridian.

Table V shows the moon's position with reference to the meridian. These seem to have been maxima when the moonwas two and nine hours east and seven hours west. It is to be noticed that at the upper transit, where from Professor Perrey's deductions we should expect to find a maximum, there is a minimum.

Table VI gives the moon's position referred to the sun. Dividing the twenty-four hours into four equal parts, corresponding to the times of conjunction opposition and the two quadratures, we find

at conjunction	32	
„ opposition	37	
„ quadrature	...	74
	69	74.

This result is opposed to Professor Perrey's conclusion and to the common idea that the full and new moon are in some way connected with earthquakes. East of the meridian the maximum was at a distance of four hours ; west of the meridian there was no well marked maximum.

In tables VII and VIII, I have arranged the numbers according to the distance of the sun and moon south of

Digitized by Google

our zenith. The figures are somewhat deceptive, as the time corresponding to a change of four degrees in declination grows longer and longer as the sun and moon get further north or south of the equator ; hence we should expect to find more earthquakes at their extreme distances north and south than at any other times. When the sun was north of the equator (or in summer) there were 69 earthquakes; when south of it (or in winter), 74.

Table VIII shows a marked difference between the number of earthquakes which occurred while the moon was north of the equator and while it was south of it ; in the former case there were 61 ; in the latter case, 82. And the maximum, after making all allowance for the difference of time mentioned above, is at the southern limit of the moon's course.

Table IX shows that the maximum number of earthquakes happened seven and eleven days before the moon's perigee.

As a general result, it may be said that the earthquakes here examined do not show a result which agrees with that of Professor Perrey. There have been no more earthquakes at new and full moon than at other times ; no more when the sun and moon were on the meridian than when off; no more at the moon's perigee than at apogee.

In conclusion, I wish to state that I do not consider results drawn from so small a number of earthquakes especially valuable; they are, however, interesting, as they are so directly opposed to statements which are generally made and commonly received.

Digitized by Google

Digitized by Google

No.	Month.	Day.	Hour.	S E o Hou Min
1	January.....	11	7.38 P.M.	W
2	„	11	10.37 P.M.	W
3	„	20	8.16 P.M.	W
4	„	20	8.21 P.M.	W
5	„	23	6.20 A.M.	E
6	February ...	2	3.7 P.M.	W
7	„ ...	8	4.52 A.M.	E
8	„ ...	15	1.18 P.M.	W
9	„ ...	16	12.43 P.M.	W
10	„ ...	21	8.56 P.M.	W
11	March	6	0.9 A.M.	E
12	„	10	10.17 P.M.	W
13	„	12	11.58 A.M.	E
14	„	13	4.41 P.M.	W
15	„	23	3.30 P.M.	W
16	„	30	9.37 A.M.	E
17	April	5	11.14 P.M.	W
18	„	6	0.35 A.M.	E
19	„	11	2.16 A.M.	E
20	„	11	8.19 P.M.	W
21	„	13	8.25 A.M.	E
22	May	3	4.32 A.M.	E
23	„	9	3.26 P.M.	W
24	„	24	7.20 A.M.	E
25	„	26	1.10 A.M.	E
26	„	26	9.10 A.M.	E
27	„	26	10.56 A.M.	E
28	„	30	9.47 A.M.	E
29	„	31	6.47 A.M.	E
30	June	5	11.31 A.M.	E
31	„	6	5.13 P.M.	W
32	„	11	8.49 A.M.	E
33	„	11	9.0 A.M.	E
34	„	19	12.21 P.M.	W
35	„	24	11.15 A.M.	E
36	„	25	0.57 A.M.	E
37	„	25	10.20 A.M.	E
38	July	18	10.17 P.M.	W
39	„	19	0.35 P.M.	W
40	„	19	9.35 P.M.	W
41	„	22	4.49 P.M.	W
42	„	23	0.29 P.M.	W
43	„	31	1.17 P.M.	W
44	August	1	7.35 P.M.	W
45	„	3	9.27 A.M.	E
46	„	10	10.55 P.M.	

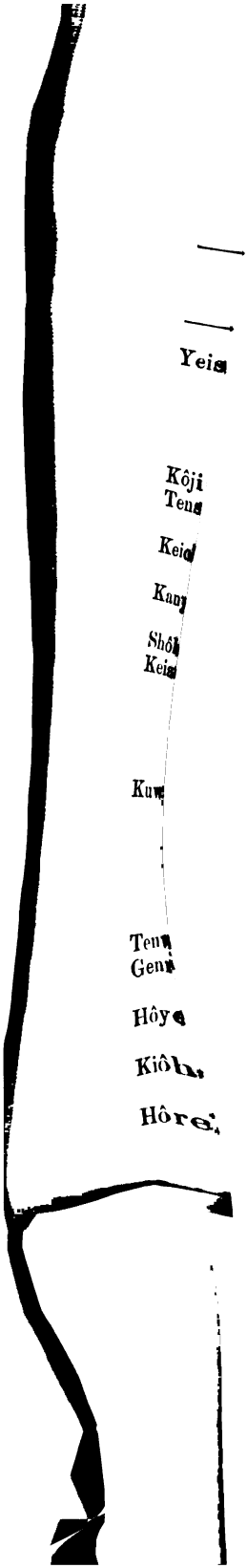
Digitized by Google

UN R W ES AND UTES.	MOON E OR W HOURS AND MINUTES.	MOON FROM SUN HOURS AND MINUTES.	SUN. DISTANCE IN DEC. DEGREES & MINUTES.	MOON. DISTANCE IN DEC. DEGREES & MINUTES.	HOURS OR MINUTES BEFORE OR AFTER NEAREST PERIGEE.
7.32	W 10.3	W 2.31	57.25	63.32	10.21 A
10.30	E 11.5	W 2.25	57.23	63.40	11.0 A
8.6	W 4.3	E 4.3	55.42	32.3	8.16 B
8.11	W 4.8	E 4.3	55.42	31.50	8.16 B
5.53	E 11.38	E 5.45	55.9	18.19	6.6 B
2.53	W 11.36	W 8.43	52.25	40.27	4.3 A
7.23	E 3.6	E 4.18	50.44	63.49	9.16 A
1.4	E 0.9	E 1.13	48.18	40.39	11.10 B
0.29	E 1.23	E 1.52	47.58	35.0	11.10 B
8.43	W 2.48	E 5.56	46.5	9.0	6.3 B
11.58	E 4 39	W 7.19	41.30	60 55	7.1 A
10.8	E 10.39	W 3.13	39.35	59 16	11.23 A
0.12	W 1.52	W 2.4	38.58	52.57	13.15 A
4.33	W 5.47	W 1.15	38.30	46.57	13.7 B
3.24	E 3.19	E 6.43	34.34	8.15	3.8 B
2.28	W 9 0	W 11.28	31.55	46.19	3.7 A
11.13	E 6.54	W 5.53	29.24	62.35	9.21 A
11.29	E 5.39	W 5.49	29.24	62.28	9.22 A
9.47	E 7.36	W 2.11	27.28	40.53	12.1 B
8.19	W 10.0	W 1.41	27.14	36.31	11.7 B
3.36	E 2.56	W 0.40	26.40	27.36	9.19 B
7.26	W 0.15	W 7.41	20.3	62.37	10.1 A
3.30	W 6.37	W 3.7	18.15	33.44	8.11 B
4.38	W 10.7	E 9.15	14.54	47.48	6.5 A
10.48	W 2.32	E 10.38	14.37	56.47	7.23 A
2.47	W 10.18	W 10.55	14.33	58.9	8.7 A
1.1	E 12.0	E 10.59	14.32	58.26	8.8 A
2.11	W 7.25	W 9.36	13.53	62.39	12.7 A
5.11	W 3.42	W 8.53	13.46	60.41	13.4 A
0.27	W 4.50	W 5.17	13.7	36.32	8.22 B
5.16	W 9.44	W 4.28	12.58	41.54	7.16 B
3.11	E 2 31	W 0.40	12.34	8.32	3.1 B
3.0	E 2.20	W 0.39	12.34	8.31	3.0 B
0.20	E 6.17	E 6.37	12.12	41.46	5.3 A
0.47	E 11.22	E 10.36	12.13	63.4	10.2 A
11.7	W 1.48	E 11.5	12.14	63.37	10.15 A
1.43	W 10.52	E 11.26	12.14	63.43	11.1 A
10.13	W 3.48	E 6.25	14.40	54.19	6.11 A
0.29	E 6.24	E 6.53	14.47	57.2	7.1 A
9.31	W 2.19	E 7.12	14.51	58.31	7.10 A
4.44	E 4.52	E 9.36	15.23	63.48	10.5 A
0.23	E 9.55	E 10.17	15.33	63.17	11.1 A
1.11	W 9.15	W 8.4	17.22	27.52	8.22 B
7.30	E 9.18	W 7.12	17.41	21.5	7.15 B
	W 3.20	W 5.59	18.5	13.43	6.11 B
	W 9.40	E 1.12	20.11	27.7	1.2 A

Digitized by Google

Digitized by Google

Digitized by Google



Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

TRANSACTIONS

OF

THE ASIATIC SOCIETY OF JAPAN.

VOL. VI.-PART III.

From 25th May, 1878,

TO

22nd June, 1878.

YOKOHAMA, LANE, CRAWFORD & Co.
SHANGHAI, KELLY & Co.
LONDON, TRÜBNER & Co.
NEW YORK, APPLETON & Co.

1878.

Digitized by Google

Digitized by Google

CONTENTS.

	PAGE.
On the Mediæval Colloquial Dialect of the Comedies, by B. H. Chamberlain Esq.	357 TO 396
Some scenes between the Ancient and the Modern Capitals of Japan, by W. G. Dixon Esq.	401 „ 431
Notes of a visit to Hachijô in 1878, by F. V. Dickins and Ernest Satow	435 „ 477
Appendix I. Extract from Captain Beechey's narrative, The Bonin Islands...	478 „ 485
Appendix II. Extract from the *Nichi Nichi Shimbun*, Account of Hachijô.....	486 „ 489
The Climate of Japan, by Dr. J. J. Rein...	491 „ 529
Catalogue of Books in the Society's Library	535 „ 540

Digitized by Google

Digitized by Google

ASIATIC SOCIETY.

LIST OF MEMBERS.

Honorary Members.

Admiral Sir C. Shadwell, K.C.B.
Captain Arthur, R.N.
S. Wells Williams, L.L.D.
Sir Rutherford Alcock, K.C.B.
Sir Thomas E. Wade, K.C.B.
Professor George E. Day, Yale College, U.S.A.
Professor W. D. Whitney, New Haven, U.S.A.
Hon. George P. Marsh, U. S. Minister at Rome.
A. W. Franks, British Museum.
Dr. J. J. Rein, University of Marburg.

Resident Members.

The Black, Roman and Italic types indicate respectively residence at Yokohama, in Tôkiyô, at the *Outports and in the Interior*.
Members changing their address are requested to notify the Secretaries.

Allen, H. Junr.
Amerman, Rev. Jas. L.
Anderson, W.
Aston, W. G.
Atkinson, R. W.
Beadon, R.
Begbie, J.
Bellamy, A.
Bingham, Hon. J. A.
Bisset, J.
Blanchet, Rev. C. T.
Bramsen, W.
Bridgford, Capt. S. T.
Brinkley, Capt. F.
Brooke, J. H.
Brown, A. R.
Brown, Rev. S. R., D.D.
Chamberlain, B. H.
Chaplin, W. S.
Cochran, Rev. G.
Cocking, S.
Conder, J.
Cox, W. D.
Dallas, C. H.
De Boinville, C. A. C.
De Groote, C.
Dickins, F. V.
Dillon, E.
Divers, E., M.D.
Dixon, W. G.
Dodds, J.
Dönitz, Dr. W.
Duer, Y.
Dwars, B. W.

Digitized by Google

Dyer, H.
Eaton, I.
Ebey, Rev. C. S.
Eldridge, S., M.D.
Elmore, J. F,
Eusden, R.
Farley, G. Junr.
Faulds, H., M.D.
Fischer, Ed.
Flowers, M: O.
Fraser, J. A.
Gay, A. O.
Geerts, J. A., Ph. D.
Glover, T. B.
Gould, J. E.
Gower, E:
Gowland, W.
Green, Rev. D. C.
Gregory, G. E.
Gribble, H.
Grigor, J.
Grigsby, W. E.
Gubbins, J. H.
Gulick, Rev. L. H., D.D.
Hall, J. C.
Hamao, A.
Hamilton, G.,
Hamilton, G.
Hartley, J.
Hattori, J.
Hawes, A. G. S.
Hay, G. D.
Hayward, Rev. C.
Hellyer, F.
Hellyer, T. W.
Hepburn, J. C., M.D. LL.D.
Hodges, G. J. L.
Holtham, E. G.
Houghton, W.
House, E. H.
Hunt H. J.
Hunt, J.
James, Lieut. R.N.
James, F. S.
James, J. M.
Jaudon, Peyton.
Jewett, F. F.
Kell, O.
Keswick, J. J.
Kikuchi, D.
Kilby, E. F.
Kinch, E.
Kingdon. N. P.
Kirkwood, M.
Latham, H., M.D.
Liddell, H.
Longford, J. H.
Lyman, B. S.
McBride, Dr. J. A.
McCartee, D. B., M.D.
McClatchie, T. R. H.
McDonald, Rev. D.
Mackenzie, H.
MacLagan, R.
McRitchie, J.
Manning, C. J., M.D.
Marshall, D. H.
Matsumoto, S,
Maundrell, Rev. H.
Miller, Rev. E. R.
Milne, A.
Milne, J.
Mori, Arinori.
Mounsey, A. H.
Murray, D., L.L.D.
Nakamura, K.
Naumann, Dr. E.
Olarovsky, A. G.
Owston, A.
Parkes, Sir Harry S., K.C.B.
Perry, J.
Petersen, J. V.
Pitman, J.
Pryer, H.
Quin, J. J.
Rickett, J. Junr.
Ringer, J.
Robertson, R.
Rosen, Baron R.
Sanjô, Kinaya.
Satow, E.
Saumarez, Hon. J. St. V.
Schaeffer, J. von.

Digitized by Google

Scott, M. M.
Shand, W. J. S.
Shaw, Rev. A. C.
Sheppard, E. T.
Siebold, Baron A. von.
Smedley, J.
Soper, Rev. J.
Stevens, D. W.
Stone, N. J.
Stone, W. H.
Struvé, C. de.
Summers, Rev. J.
Sutton, F. W., R.N.
Syle, Rev. E. W., D.D.
Terry, H. T.
Tomita, T.
Toyama.
Thomson, G. W.
Tripler, T. H., M.D.
Troup, J.
Tsuda, S.
Van Casteel, A. T.
Van der Pott, J. J.
Veeder, Rev. P. V., D.D.
Walker, F.
Walsh, C. F.
Walsh, J. G.
Walsh, T.
Warren, Rev. C. F.
Watson, E. B.
Wheeler, E., M.D.
Whitney, W. N.
Whittall, E.
Wilkin, A. J.
Wilkinson, H. S.
Wilson, J. A.
Wilson, C. G.
Winstanley, A.
Woolley, W. A.
Wright, Rev. W. B.
Zappe, E.

Non-Resident Members.

Audsley, G., Ashdown.
Bowes, J., Liverpool.
Boyle, R. V., C.S.I.
Brown, R. M., Shanghai.
Bryner, J.
Burnside, Rev. H., Church Mission House, Salisbury Square, London.
Caldwell, J., M.D.
Day, F.
Fagan, C. S. F.
Flanders, C. A.
Hall, F., LL.D.
Hayllar, T. C., Hongkong.
Irwin, R. W.
Kinder, C. W.
Mounsey, A. H.; Athens.
Pearson, G. C., London.
Phear, Hon. Sir J. B., Ceylon.
Pole, G. H.
Robertson, John, Shanghai.
Savatier, L., M.D.
Shand, A. A., London.
Smale, Sir John, Hongkong.
Smith, Hon. C. C., Hongkong.
Von Brandt, M., Peking.
Walter, J., Shanghai.

Digitized by Google

OFFICE BEARERS.

SESSION 1878-79.

President,
DAVID MURRAY, LL.D.

Vice-Presidents,
Rev. E. W. SYLE, D.D.
J. J. KESWICK.

Councillors,
Tôkiyô.—Rev. J. L. AMERMAN.
B. H. CHAMBERLAIN.
W. S. CHAPLIN.
E. DIVERS, M.D.
D. B. MCCARTEE, M.D.
Yokohama.—C. H. DALLAS.
F. V. DICKINS.
J. A. GEERTS, PH. D.
J. C. HEPBURN, M.D., LL.D.
T. WALSH.

Corresponding Secretary,
E. SATOW.

Treasurer,
T. W. HELLYER.

Recording Secretaries,
Yokohama.—
Tôkiyô.—W. G. DIXON.

Librarian,
Rev. C. T. BLANCHET.

Digitized by Google

ON THE MEDIÆVAL COLLOQUIAL DIALECT OF THE COMEDIES.

BY

R. H. CHAMBERLAIN, Esq.,

Read before the Asiatic Society of Japan, on the 25th May, 1878.

One of the many difficulties which confront the student of Japanese is the difference subsisting between the spoken and written dialects,—spoken and written *languages*, indeed, they may well be called. For so broad is the distinction that a person, who, through long residence, should have become completely familiar with all the phrases and idioms in every-day use, might yet find it impossible to understand clearly a single sentence of a Japanese classical work or of a leading article in a modern Japanese newspaper, much less of a letter written to him by a Japanese friend; while on the other hand, a European student of any of the branches of the written tongue would fail (though, perhaps, to a less degree) in comprehending Japanese conversation, even supposing him to have acquired a knowledge of the accent peculiar to the natives of Japan. To a certain extent, no doubt, the distinction between written and spoken holds good in every tongue; and we have the great authority of Goethe* for believing that this distinction is not only an inevitable one,

* See "Wahrheit und Dichtung," pt. 2, book, VI, near the end.

Digitized by Google

but one which it is right and necessary to maintain. Yet, though there can be no doubt that a foreigner who should only have studied Spenser and Shakespeare would find it hard work to make himself understood at an English railway-station, and that another foreign student of even so modern and plain-spoken a writer as Macaulay would assuredly move to mirth the company assembled in an English drawing-room, were he to mould his conversational sentences upon the the written sentences of his favourite author, still it must be allowed that even in English, where the line of demarcation is more clearly drawn than in some other European languages, we have nothing at all approaching to the gulf which is in Japan fixed between what is written and what is said.

Colloquial forms are, it is true, of tolerably frequent occurrence in short newspaper paragraphs (especially of the more vulgar class of newspapers), and in books intended for women and the uneducated generally. But even the most popular works usually contain many passages written in a style more or less classical, and the very voluminous educational literature which has sprung up of late years, and is meant to reach all readers, makes no endeavour whatever to be colloquial. The only productions worthy of notice which do so are the various collections of Buddhist discourses termed *Dauwa*, written in the modern dialect of Kiyauto, and portions of a commentary on the *Kokinshifu*, in the same dialect. Here, in Yedo, we have the *Kauyeki Mondafu*, four or five works by Hirata and perhaps a few others. But of anything older, there is scarcely a trace. The consequence of this is that the philological history of the dialect spoken around us is involved in considerable obscurity. Here and there, in the literature of a bygone day, we think we find traces of the old spoken tongue, and in one or two cases it has been supposed that the modern colloquial form is, in fact, more primitive than that sanctioned by written usage. It is open to any student of the *Tosa Niki* to believe that its language comes, at least, very near to the spoken dialect of the time in which it was

Digitized by Google

written (ninth century of our era), and he might show probable grounds for his opinion. But above that and below that again, we are lost in doubt. Three or four centuries after the composition of the above-mentioned work, the written language of prose became fixed for all time, that of poetry having been already settled at an earlier date; but it is impossible to believe that the spoken dialect was equally stagnant. Of what it was during most of the centuries of Japanese literature we have, and can have, no information; and it therefore becomes doubly interesting to discover at least one remnant thereof in a place to which the attention of students has hitherto been but little directed. I allude to the farces or comedies called collectively *Nou no Kiyaugen*, dating from the fourteenth or fifteenth century, and still constantly acted on the *Nou* stages at Ihigura and Asakusa in this city of Yedo, and perhaps also in the old Western capital. These plays, as acted on the Yedo boards, exist only in manuscript†; and one of the comedians, Mr. Nohara Yashichirau, having copied out for me the entire collection, filling altogether twenty good-sized volumes, I have been enabled to investigate them more carefully than the mere assisting at their representation will permit, and I beg, as the result of this study, to lay before the Society the following appreciation of the linguistic peculiarities by which they are distinguished.

Broadly speaking, it may be stated that the mediæval colloquial dialect differs from that of the present day chiefly in the extensive use it makes of personal pronouns and of causative and potential honorific verbal forms, and in its retention of classical and other archaism both lexicographical and syntactical. A few of its constructions also show a slight similarity to those of the epistolary

† I have seen an edition said to have been printed at Ohosaka, and bearing date 1831. It purports to be a reprint of an edition published in 1699. It is so corrupt and modern both in phraseology and in spelling, that I think there is sufficient reason to believe that the original draft of the works was in it tampered with for the purpose of making them more easily comprehensible to the Ohosaka and Kiyauto audiences of the time at which it was issued. We know from other sources that the text of the comedies was often very freely treated by the actors.

Digitized by Google

dialect ‡, thus affording grounds for the presumption that the latter is not so completely artificial as might at first sight be supposed. Instead, however, of continuing thus to generalize, it will be more to the purpose to take in order the various parts of speech and rules of syntax in which differences exist, and to note down the peculiarities that offer themselves for our consideration,—premising that the *modern* dialect here taken as the standard of comparison is that spoken by the natives of Yedo. Doubtless the popular tongue current in Central Japan differs less from the comic language than does that to which we are all of us accustomed. But the fact of the language of Yedo having now become the type to which the colloquial language of the whole empire must tend to comform, and still more the further fact of our having for it alone a reliable grammer and dictionary render it a more practical, as well as a more practicable, standard than any other for students both in and out of Japan. At the same time, I have by a perusal of several of the *Dauwa* and of other books purporting to contain portions written in the modern dialect of Kiyauto, endeavoured to master the peculiarities of the latter, and have, in each case of resemblance between it and the language of the comedies, directed attention thereto. In knowledge derived merely from books, and especially from books so little to be depended upon as those purporting to be written in any colloquial form of Japanese, mistakes are always likely to occur, and I shall, therefore, feel particularly obliged to any one whose personal acquaintances with the dialect in question may enable him either to detect any errors or to trace any neglected resemblances in those portions of the following essay. Besides the Yedo dialect, and that at present spoken at Kiyauto, the standard written tongue will also occasionally be referred to, as indeed must always be the case whenever philological matters are to

‡ *e.g.* the occasional use of the words *gi* and *dan* in the manner in which they are employed in letters. (In such of the non-colloquial portions of the comedies as mimic the style of the *Nou*, the use of the substantive verb *samuraf* and of other epistolary words renders the likeness much more striking.)

Digitized by Google

be treated of. The system of transliteration adopted is that which in all cases renders each *kana* sign by the same Roman letter or combinations of letters, without respect to the varying pronounciation of the different provinces of modern Japan. The only exceptions made are in the case of the final ñ for which, unfortunately, no italic type exists in the font employed, and in that of those double letters (chiefly *tt*) where, in the *kana* writing of the colloquial tongue, the letter *tsu* is merely a sign of consonantal reduplication, and obscures the etymology of the word instead of illustrating it.

We come, then, to

First. Substantives.—Under this heading, the plurals alone call for any remark. The Plural suffix *domo* is rather more freely used than is the case in modern times. Thus we find *nagusami-domo*, 'amusements'; *tsumagi-domo* 'fire-wood'; *komadomo*, 'horses.' The plural particle *shiuu*, obsolete or obsolescent at Yedo, but still to be heard at Kiyauto, is also not uncommon, and sometimes exchanges its plural signification for one slightly honorific, ex., *niyobau-shiuu*, 'your good wife.'

Second. Personal Pronouns.—The following forms are met with, the order given being that of an increasing degree of politeness. *i.e.* of humility for the 1st person, and of deference for the second (the forms marked with an asterisk are rare):

1st. person.—**Wore* (used in anger or in pride).
**Mi* (generally „ „ „ „).
Ware-ra gotoki (usually to inferiors); literally 'people like myself.'
Kochi (to inferiors, and between low born equals); it corresponds to *sochi*, 'you.'
Konata (to inferiors).
Midomo (to those slightly inferior or superior).
Soregashi, plur. *Soregashi-domo* (to all classes),
**Watakushi* (to superiors.

Digitized by Google

Besides the above, which are used by all classes, must be noted the following:

Gusou (used by priests only),

Waraha plur. *Waraha-domo* (used by women only),

though both these categories of persons also frequently use the other pronouns before enumerated. The most commonly employed of all the foregoing expressions is *soregashi*, which takes the prace of the modern *watakushi*, a term that but seldom occurs.

2nd. person.—*Onore*, plur. *Onore ra*, (chiefly used in reviling an inferior).

Nanji, plur. *Nanji-ra* (to servants, animals, etc.).

Sochi, plur. *Sochi-tachi*, (to inferiors).

Soko na hito } (between low born equals).
Koko no mono } It means 'you there.'

Wagoriyo, plur. *Wagoriyo tachi* (familiar).

Sonata, plur. (also sometimes merely honorific for the sing.) *Sonata-shiyuu* (to all classes, excepting those greatly inferior.)

Konata, plur. *Konata-shiyuu* (to equals and superiors.—*Konata* and *Sonata* frequently alternate in speaking to the same person).

Besides the above, must be noticed the pronoun

Gobou or *Gobou Sama*, (used in addressing a priest).

Sonata Konata and *Wagoriyo* are the most usual pronouns of the 2nd person.

It will be noticed that from these two lists we miss some of the pronouns most commonly used at the present day, such as *Boku* and *Temahe* for the 1st person, and *Anata*, *Omahe*, *Temahe*, *Sensei* and *Kimi* for the 2nd.† On the other hand, *Ware-ra gotoki*, *Kochi*, *Waraha*,

† Some of the words enumerated occasionally occur but in another sense. Thus *Anata* preserves its orginal siguification of 'on the other side.'

Digitized by Google

Wagoriyo and *Konata* (in the sense of 'you') have now completely fallen into disuse. Personal pronouns being in Japanese merely more or less polite nouns, whose original force as such is generally still felt by the speaker, the change brought about in their usage by the lapse of a few centuries is no more than we should have expected.

Japanese can scarcely be said to possess a 3rd person distinct from the 2nd; so that there is nothing to notice under that heading.

THIRD. INTERROGATIVE PRONOUNS AND ADVERBS.—As this class of words mostly appears in the text in Chinese characters, and not in *kana*, it is difficult, if not impossible, to ascertain the sounds originally meant to be conveyed. To judge, however, from the occosional *kana* renderings, the Interrogative Pronouns and Adverbs were, at the date of the composition of the comediettas, in a state of transition,—modern forms, such as *dochi*, 'where?' and *donata*, 'who?' having made their appearance, but not having as yet completely superseded more classical expressions. In the case of the most common word for 'who?' (誰), the *kana* even can give us no information as to whether the mediæval pronunciation was *tare*, as in the written tongue, or *dare* as in our own days. For *ta* and *da* are in Japanese written with the same letter, and the omission, in writing, of the *nigori* marks distinguishing the *tenues* from the *mediæ* is so common, that no inference can be drawn therefrom to the actual sound intended. It is, however, the habit of the comedians to pronounce it *tare*; and the constantly recurring expression 誰ゾ which can scarcely be read othwise than, *tazo* would seem to lend its support to their practice.

FOURTH. ADJECTIVES.—The mediæval dialect agrees with that of the present day in drooping the letters *k* of the Attributive, and *sh* of the Conclusive, forms. Thus we have *omoshiroi* for both *omoshiroki* and *omoshiroshi*; *chikai* for both *chikaki* and *chikashi* etc., etc. The only common exceptions to this rule are the Negative Adjective, whose Conclusive form *nashi* occurs not in-

Digitized by Google

frequently in the comediettas, as, indeed, it does occasionally on the lips of speakers at the present day, *yoshi* (for *yoi*), 'good' (though *yoi* is more frequent), *hiroshi*, 'broad', and *nikushi*, 'disagreeable'—the two latter, however, merely in a couple of continually recurring set phrases.

With regard to the Adverbial form, which in the written language ends in *ku*, it is curious to find the usage of the comedies more corrupt than that of Yedo at the present day. The habit (characteristic of the Central dialect) of dropping the letter *k* of this termination, and simply leaving the vowel *u* as the sign of adverbiality, had already taken root at that early date, ex., *hayau*, *tsuyou*, *nemuu*, *yoroshiu*, for *hayaku*, *tsuyoku*, *nemuku*, *yoroshiku*. These abbreviated forms perpetually occur even before the termination *te* and the negative Adjective *nai*, ex., *nikuute*, *kurushiunai*, *younai*, whereas it is still universal in Yedo to say *nikukute*, *kurushikunai*, *yokunai*, etc., etc. The word *nai* itself has an Adverbial form *nau*, for *naku*, the original form, and that which the inhabitants of Yedo universally employ. On the other hand, the comic dialect retains the old classic use of the Adjectival Root in exclamatory phrases, thus: *Ara! kokoroyasuno!* 'Oh! how pleasing'!

The conjugational forms of Adjectives occur less frequently than in modern conversation whether at Yedo or at Kiyauto, the language of the comedies preferring the periphrasis with one of the Auxiliary Verbs; thus, for *hayakatta* ('has been quick'), *warukarau* ('is likely to be bad'), we find *hayau gozarimashita*, *waruu origarau*. This remark includes the Conjugational forms of the Negative, Adjective for which the Negative forms of the verbs *gozaru*, *oriyaru*, etc., are almost invariably substituted.

The classical abstract Substantive in *sa* formed from the Desiderative Verbal Adjective, is occasionally to be met with in the plays, ex: *itsuken itshitasa* ('the desire to see'). Sometimes this syllable *sa* is suffixed in a similar manner to Chinese words generally used as Ad-

Digitized by Google

jectives; thus from *fubin* ('helpless'), we have the form *fubinsa* ('helplessness'). Such barbarisms are, however, rare. The only other archaism connected with the Desiderative form of Adjectives is the use of its old Hypothetical Mood, obtained by suffixing the syllable *ba* to the Adverbial termination, thus *netakuba*, for *netakereba*.

FIFTH. VERBS.—*First. Substantive Verbs.* *Aru*, *woru* and *wiru*, 'to be,' are all of frequent occurrence; it should be observed that *aru* never takes the Honorific termination *masu*,—the familiar forms *arimasu* and *arimasenu* not having as yet made their appearance. Neither are *de aru*, *de atta* and *de arau* ever contracted into *da*, *datta* and *darau*. On the other hand, there is in perpetual use the strange and perplexing form *jiya*, still so common in the Central dialect, which is not (like the *jiya* of Yedo speakers) a contraction of the Particles *de ha*, but a Substantive Verb corresponding to the Yedo *da* ('I am,' 'thou art,' he is,' etc.). This latter is known to be a corruption of *de aru*; and I venture to think that *jiya* is likewise a corruption of *de aru*, and the difference between *da* and *jiya* merely dialectical. It is true that our finding no Past Tense *jiyatta* and no Future *jiyarau* militates against this supposition; but it should be remembered that neither is *da* itself inflected through all the Moods and Tenses. Another curious and extremely frequent form is *na*, still, if the *soi-disant* colloquial books are to be trusted, in occasional use at Kiyauto, and which is apparently a corruption of the old Substantive Verb *naru*, and identical with the modern Adjective Particle *na*; the only difference between them being that, whereas in later times the word has sunk down to the condition of a *mere* Particle, in the older dialect it retains, alongside of its secondary use as a Particle, its verbal force, ex:

Soregashi ha fuannai na hodo ni, wagoriyo saki he yukashimase. ('As I *am* unacquainted with the 'house, do you, please, go first.')

Konata ni ha ritsupana to that I *am oboshi-meshimasuruka?*

Digitized by Google

('Do you think that I *am* elegantly dressed?')

This verb *na* is not inflected.

Oriyaru†, 'to be' (also, occasionally, 'to go' and 'to come'), never conjugated honorifically,‡ but itself, apparently, slightly honorific in meaning, is a word of constant occurrence in the plays, and is put for the most part into the mouths of common people. It is quite unknown in modern Yedo. A curious form of it is the Perfect *oriyattare* after *koso*.

The Honorific Verb *gozaru* is the most extensively used of all the Substantive Verbs, and, besides its usual modern meaning of 'to be,' possesses occasionally the significations of 'to go,' 'to come,' and 'to sit,' corresponding, in fact, very closely to the familiar compound *o ide nasaru*. We find it conjugated through almost all those simple forms which are now no longer heard, such as *gozatte, gozaranu, gozarau*, etc., including such strange ones as *gozari* (the Root), *gozare* (the Imperative), and *gozare* and *gozattare* (Perfects governed by the Particle *koso*). Alongside of these simple forms there exists the more familiar doubly Honorific Conjugation: *gozarimasuru, gozarimasen*, etc., including the queer-sounding Negative Participle *gozarimaseide* and the Imperative *gozarimasei*. It should be observed, under the heading of the verb *gozaru*, that instead of the Negative Concessive *gozaranedomo*, we find the Adjectival form *nakeredomo*, and instead of the Negative Past *gozaranda*, we find *gozanakatta*. *Gozanai* also occasionally replaces *gozaranu*.—*Desu*, the common modern contraction of *de gozarimasu*, scarcely ever occurs, nor are there any instances of *deshita* and *deseu* the contracted forms of *de gozarimashita* and *de gozarimaseu*. It is also necessary to remark that the letter *r* of *gozari* is never elided in the comedies as it so commonly is in our day, and that the Present Tense is almost universally *gozarimasuru*,—not

† In the printed edition *oriyaru* is constantly superseded by *ochiyaru* which would seem, from other sources, to have been already in common use at the beginning of the 17th century.

‡ Only once have I met with the Honorific Potential *oriyarashimasu*. It occurs in a play whose phraseology is throughout peculiar.

Digitized by Google

gozarimasu. Indeed, after Verbs in general, *masuru* is used much more frequently than *masu*: its Conjugation through the other Tenses is precisely the same as at the present time, except that in the Future *masau* alternates with *maseu.*

Every peculiarity relating to the Substantive Verbs may, owing to the incessant use which is made of them, be, in a manner, said to belong to grammar. Other verbs, belonging, as they do, exclusively to lexicography, do not call for mention in a paper which is not intended to form a dictionary of mediæval colloquial Japanese.§ I, therefore, pass on to a consideration of:

Secondly. The Conjugational Forms in General.—The following are the chief mediæval pecularities:

In Verbs whose Roots end in either of the letters *hi* (*bi*) or *mi*, this letter is vocalized into *u* before the terminations of the Past Participle and the Past Tense,—a practice which still obtains in the Kiyauto or Central dialect, ex.: *chigaute, iute, oyouda, nouta,* instead of *chigatte, itte, oyonda, nonda,* as would be said in Yedo. When the Root ends in *shi*, the *sh* is dropped before the same terminations, ex.: *asobaite, kakuite, otoita, tohoite* for *asobashite, kakushite, otoshite, tohoshite.* Of these abbreviated forms the Kiyauto dialect would still seem to make occasional use. In all other cases, the Past Participle and Past Tense are formed in the comedies in the same manner as in modern Yedo, ex.: *kashikomatte, kashikomatta, kiite, kiita.*

The Conditional Past terminating in *tareba* is never abbreviated into *tara*, and always retains its classical signification of 'when so and so had,' or 'as so and so had.'

The Hypothetical Past in *tareba* is rare, being constantly replaced by a circumlocution composed of the Past Tense of the Verb in question and the word *naraba*, ex.: *nouta naraba* instead of *nondaraba.* It is worthy of notice that, though past in form, this phrase is often used

§ A few of the most common will be found in the list of peculiar words given further on.

Digitized by Google

to designate a future action or event, and that it sometimes takes the place of both the Conditional Past and the Conditional Present, ex.: *waseta naraba*, 'when he comes.'

Of the Tense termed by Mr. Aston the Probable Past no examples have been met with in the Mediæval Dialect; and the Frequentative Form is almost equally conspicuous by its absence. Of the modern Frequentative in *tari* I have noted but the one example *miyetari miyenandari itasu*, 'sometimes visible and sometimes invisible.' The classical Frequentative in *tsu* is likewise extremely rare. When it occurs, the Root is affected in the same manner as that described under the heading of Past Participles, thus *utautsu mautsu*, 'both singing and dancing.'

The Future of all Verbs is obtained by simply vocalizing the classical termination *n* into *u*, ex.: *yukau, kou* ('will come'), *kureu, miu*. There are none of the irregularities which, in the formation of this tense, characterise the Yedo dialect, and likewise (though to a less extent) that of modern Kiyauto. It may also be remarked that the simple Future, without the Honorific termination *maseu*, seems to have been more frequently used in the middle ages than is the case in our own day. Besides the ordinary Future in *u*, there is another rarer one, now obsolete, formed by superadding to it the syllables *zuru*, ex., *itasauzuru*, from *itasu*, 'to do.' Occasionally a still further change is made by eliding the syllable *ru* of this suffix, thus *mamorauzu* (for *mamorauzuru*), from *mamoru*, 'to watch over.'

The Negative conjugation of Verbs is, subject to the exceptions noted below, that given in Mr. Aston's "Grammar of the Spoken Language" as the normal one, and not that§ formed by inflecting through the various Moods and Tenses the Negative Adjective *nai*, for which the dialect of Yedo has so marked a predilection. The exceptions are as follows:

The Negative Hypothetical Mood generally ends in *ide ha* instead of *zu ba*, ex. *gozaraide ha*, 'if there be

§ See Aston's Grammar, par. 55.

Digitized by Google

not.' It constantly corresponds to the vulgar Yedo form in *nakuchiya*, having, like it (owing to the elision of the word *naranu*) the signification of the English 'must,' ex., *O tomo itasaide ha*, 'I must accompany you.'

The Negative Participle is mostly formed by adding the termination *ide* to the Negative Base, ex., *gozaraide* (from *gozaru*), *shiraide* (from *shiru*), *shireide* (from *shireru*), *ohose-tsukeraremaseide* (from *ohose-tsukeraremasuru*).

For the Imperative, both Positive and Negative, see further on.

The termination *mai* of the Negative Future appears in the archaic form of *majii* or *majiki*, thus: *kudasaremajii*, *kamafumajiki*.

To the modern termination *eru* of the Present Tense of Verbs of the Second Conjugation (including all Causative, and Passive Verbs) is almost invariably preferred the clasical form *uru*, thus tending to negative the idea that the former is, in reality, the more ancient of the two. Thus we have *usuru*, *wasuru* ('to come'), *ageraruru*, instead of *useru*, etc.

Of the modern form of the Negative Potential some examples occur, thus *yukarenu*, 'I cannot go'; *mataremai*, 'I do not think I can wait'. But the classical method of forming this Mood, which consists in prefixing the word *ye* to the common Negative form, is the one most frequently employed by the comic authors; and, indeed, the archaism would seem not even yet to have completely disappeared from the Kiyauto speech; thus: *ye shiraide*, 'unable to know'; *sumafu wo ye torimasumai*, 'I do not think I shall be able to wrestle.'

We now come to those Honorific Verbal Forms, which, from the earliest to the latest phase of the language, have always played so important a part therein. The common modern Honorific circumlocution, formed by prefixing to the Root of the Verb the Honorific Particle *o* and suffixing to it the appropriate Mood and Tense of the Honorific Verb *nasaru* was more sparingly used in the middle ages than is the case in the modern tongue; and the synony-

Digitized by Google

mous construction obtained by substituting *kudasaru* for *nasaru* was scarcely ever employed except in one or two set phrases, such as *O ide nasarete kudasaremase*, 'Pray condescend to come;' *O kokoro yasuu o me wo kudasaruru o kata*, 'A gentleman who condescends to honour me with his friendship.' Instead of these we find the copious Honorific use of the Causative and Potential Verbal forms already noticed as one of the most striking characteristics of the mediæval colloquial dialect, ex., *mafusaremasuru*, *wirarureba*, *yukashimasu*, *misasrareta*, *dekasashimashita*, all of which are as simple in signification as the Verbs *mafusu*, *wiru*, *yuku*, *mite*, *dekashita*, from which they are respectively derived, though either Potential or Causative, or *both* Potential *and* Causative in form. The student of the mediæval dialect who bears this peculiarity in mind will be saved at the outset from many misapprehensions. Thus the word *mahasu*, in the comedies, almost always means 'to dance,' it being the *Honorific* Causative form of *mafu*, 'to dance,' and not the *Real* Causative form of *maharu*, 'to turn round.' Thus, too, the word *nomasu*, is merely the *Honorific*, and not the *Real* Causative of *nomu*, 'to drink.' To obtain the *Real* Causative, we must superadd a second Causative termination, and say *nomasasu*. A list of all the methods of forming the Imperative Mood that have been noticed in the comedies will best illustrate this Honorific use of Causative and Potentials; and a reference to the pages of Mr. Aston will show the difference subsisting on this head between the mediæval speech and that of the present day. The Imperatives may be thus classified, the order followed being that of an increasing degree of politeness:

1. Simple form† (used to the speaker's own servants, and also by way of insult). { 1st Conj. (term. *e*) *yuke*, *ihe*. 2nd Conj. { (term. *ei*) *kurei*, *tomei*. (term. *yo*) *miyo*, *ideyo*

† Besides the regular simple form of Imperative given above, there are two other irregular forms in common use. One of them is homonymous with the Future in *u*, ex., *usuu*, 'go away;' *kikau*, 'listen.' The other is homonymous with the Future in *zu*, ex., *usuzu*, *kikauzu*. These forms are, perhaps, even ruder than the regular Simple form.—*Gozare* and *oriyare*, though simple in form, are as polite in intention as the Imperatives of the 4th class.

Digitized by Google

2. Honorific Particle *o* prefixed to Imperative of Compound Conjugation in *yaru* (used to those slightly inferior, and familiarly between low-born equals).	*o kuriyare* (=modern *o kun nasai*), *o machiyare.*
3. Imperative of Honorific Verb *masu* suffixed to the Root (slightly familiar).	*wosamemasei, damarimasei.*‡
4 Imperative of Honorific Verb *masu*, suffixed to Root of Causative form (the most common polite form used to those slightly inferior and to equals).	*kuresashimase, yobaharashimase, kisashimase.*§
5. Potential (used to superiors).	*ohoserarei, goraujirarei.* ('look').
6. Honorific Particle *o* prefixed to Potential (polite to superiors).	*o yurusarei.*
7. Causative and Potential (very polite to superiors).	*kikaserarei, toraserarei.*
8. Imperative of Honorific Verb *masu* suffixed to Potential (extremely polite to superiors).	*goraujiraremasei* ('look').
9. Imperative of Honorific Verb *masu* suffixed to Causative and Potential (extremely polite to superiors).	*tsugaseraremasei.*
10. Compound Imperative, formed by suffixing the Simple or Honorific Imperative of Honorific Verb *kudasaru* to Causative, or Causative and Potential, Past Participle of the Verb in question, preceded or not by the Honorific Particle *o* (the most polite form of supplication).	*o yurusarete kudasaremasei; agesaserarete kudasarei.*

‡ *Masu* has two Imperatives, *mase* and *masei*. Euphony alone seems to determine which should be used in each particular case.

§ *Oriyaru*, 'to be,' so common in medæval colloquial Japanese, may possibly be but the second Compound Conjunction of *woru*, which has

Digitized by Google

The ingeniously complicated, and, indeed, over-powering, politeness of this last form of Imperative would altogether defy a literal rendering into our less courteous mother-tongue.

The Negative verb has corresponding forms, thus *kuruna* (from *kureru*), *kakusashimasu-na*, *nukasaserare-masuru-na* ('do not be deceived.')

Besides the ordinary conjugation, of whose peculiarities we may now take leave, there are two Compound Conjugations unknown to the modern language. The First of these is formed by suffixing to the root of the Verb the requisite Mood and Tense of the Substantive Verb *woru*, 'to be,' thus *shi-woru*, 'to do' (from *suru*); *kuhahe-wotta*, 'has added,' from *kuhaheru*); *wi-woru*, 'to be' (from *wiru*); *use-worau*, 'get you gone' (from *useru*). This conjugation, not being at all Honorific in signification, is but sparingly employed.

The Second Compound Conjugation is slightly Honorific, and is, in the comedies, a very common form of address between persons of a low, but equal, rank. It is obtained, in Verbs of the 1st Conjugation, by prefixing the Honorific Particle *o* to the root, and suffixing thereto the appropriate Mood and Tense of the Verb *yaru*, 'to give,' which is probably, however, in this case, but an euphonic variation of the Substantive Verb *aru*, 'to be,' thus: *o shiriyatta*, 'you' or 'he knew'; *o shiriyaranu*, 'does not know' (from *shiru*), *o nomiyare*, 'please to drink' (from *nomu*). In Verbs of the 2nd Conjugation,—at least, in such of them as have *e* as the final letter of the Root,—the letter *e* is changed into *i* before adding the termination *yaru*, ex. *o tsukiyatte*, 'placed' (from *tsukeru*); *o homiyare*, 'praise' (from *homeru*). When a Verb already compound is to be thus conjugated, the Honorific Particle is placed between the two members of the original compound, ex. *yuki o atariyatta*, 'you have met' (from *yuki ataru*). Both these Compound Conjuga-

the same signification. 於 (*o*) and 乎 (*wo*) have probably long been pronounced alike, and in transcribing a colloquial expression into *kana*, the orthographical distinction might well be overlooked.

Digitized by Google

tions occur chiefly in the Past Tense, Past Participle, and Imperative Mood.†

Of Verbal forms which must be considered altogether irregular, we find the following perpetually recurring terms.

isshi said (for *itta*); from classical *ihishi*.
itsuba (for *iheba*); a classical word.
katte, borrowed (for *karite*); still used at Kiyauto.
kikasau, I will tell (for *kikaseu*): from *kikaseru*.
kokoroyegatanai, incomprehensible (for *kokoroyegatai*).
* *tabe* / *tamore* } 'give,' (for *tamahare*).
tabi, the Root of the same Verb.
tamorau, will give, (for *tamaharau*).
† *worinai*, is not (for *woranai*) ; from *woru*.
yosou, 'appearing to be good (for *yosasou*).‡

SIXTH. PARTICLES AND SYNTAX.—It will be most convenient to divide this heading into two sections, and to consider in the first place those peculiarities which the mediæval dialect has in common with the standard written tongue as opposed to modern colloquial usage, and in the second place, the characteristics marking it off both from the written, and from the modern spoken, languages :

First.—The chief peculiarity distinguishing the mediæval from the modern colloquial dialect, is the usual retention by the former of the classical government of the Perfect form of Verbs by the Particle *koso*, ex., *Sono go ha o tohodohoshiu koso gozare*, 'It is indeed long since I last came to see you;' *You kŏso oriyattare*, 'You are indeed welcome.' The parallel construction with Adjectives is extremely rare, showing that the Perfect was already

* This Verb was, at the time of the composition of the comedies, unsettled, not only in form, but in signification ; for we find it both in its classical meaning of 'to condescend to give' and in its modern sense of 'to eat.'

† This irregular Present is all the more curious as the Past *woranan-da* is quite regular.

‡ Perhaps, in this case, it is rather the modern form which should fitly be termed irregular; the Root is *yo*, and analogy would, therefore, give *yosou* as the inflection denoting probability.

Digitized by Google

in the middle ages an obsolescent inflection. A curious occasional construction with *koso* is that in which, preceded by a Past Participle (almost invariably the Past Participle of a Substantive Verb), it terminates a sentence, which then has the force of an exclamation, as in the following example: *Kayau ni wosamaru mi yo ni umare-ahi, reinen ahi-kaharazu mitsugi-mono wo sashi-age ni noboru yau na taikei na koto ha gozatte koso!* * 'Oh! the 'happiness of having been born in such peaceful times, 'when, year after year, one can go up to the capital to 'pay one's lord his taxes!'

The suspension of a clause by the Radical form of a verb, a classical construction which is seldom used nowadays, was still frequent in the Middle Ages. The sentence just quoted offers an example: *wosamaru mi yo ni umare-ahi,.....*

The expletive Particle *bashi*, now fallen into disuse, is to be met with occasionally in the Comedies, ex., *Urami to bashi omoute kuru-na*, 'Please do not bear me malice.'

The obsolete Particle *kana*, whose use is equivalent to the emphasising of a word or to the employment of the emphatic words 'oh! how.....' at the beginning of a sentence, occasionally occurs in the pages of the comic authors, ex., *Sate mo! sate mo! hara no tatsu kana!* 'Well, to be sure! I *am* angry.' Another mediæval use of this particle is to give a slightly dubitative force to the sentence. In this case it should probably take the *nigori*, and be read *gana*, thus: *Go rikou de gana gozarau*. 'I think you must be meaning to joke.'

The now obsolete Particle *kashi*, indicative of earnest desire, is occasionally to be met with,—chiefly in a few set phrases where it is construed with the Imperative Mood, ex., *Ahare! yado ni wite kurerarei kashi!* 'Oh! how I hope he may be at home!'

The use, which is perpetual, of the Particles *ni yotte*, meaning 'as' or 'since,' to connect two clauses of a sen-

* In cases like the above, *koso*, being at the end of the sentence, can of course, govern nothing. A similar instance is offered by the common exclamatory phrase *sareba koso*! 'well, then!'

Digitized by Google

tence, forms one of the points of contact between the mediæval colloquial, and the epistolary, dialects. The use of the synonymous Particles *hodo ni* is another, ex., *Kami-gami ohoshi to mafusedo, tori-wake taushiya no on koto ha negafu koto no banzhi kanahaseraruru ni yotte, shin zen mo hitoshiho niginigishii koto de gozaru,* 'There are a 'great number of gods and godesses; but as the god of 'this shrine is one who, above all others, grants the 'requests of his worshippers, the temple-court is quite 'unusually crowded.' *Chito go you ga gozaru hodo ni, kore he gozarimasei.* 'Please step this way, as I have a little 'business with you.'

An obsolete use of the Particle *wo*, which was still current in the Middle Ages, is that in which it connects clauses, ex., *Ara! fushigi ya! yazen makari-kahetta wo, haya donata yara go zonzhi de "mono mafu" to aru.* 'How 'strange! I only got home last night, and yet there is 'already somebody or other who, having heard of my 'return, is calling out for admittance.'

Second.—The circumlocution which substitutes for the Past Tense one of the Substantive Verbs preceded by the Past Participle of the Verb in question was more frequent in the Middle Ages than at the present day, ex., *Nan to oboshimeshite, o hito wo kudasarete gozaru?* 'What was your reason for sending a messenger to me'?

The incorrect modern idiom which makes the Past Participle do duty for the Imperative is not common in the older tongue. We find, however, a few instances of its use, ex., *Iza! oriyatte!* 'Come along!'

The inflection *domo* of the Concessive Mood is never replaced as in modern times, by the circumlocution *to ha ihedomo.* The concessive phrase formed by adding the Particles *to mo* to the Conclusive form of the Verb frequently appears in a somewhat archaic garb, thus: *Sono yau na koto wo iutari to mo,* 'It is all very well your speaking like that, but...'!

The mediæval dialect has a liking for the Postposition *ni*, using it occasionally where another would be preferred by modern speakers, thus we find: *Shiyotaimen ni gozaru,*

Digitized by Google

'This is the first time we have met;' *Go taikutsu ni gozarau*, 'You must be feeling bored;' *Makoto ni nasarenu*, 'You do not believe it.'

The Postposition *no* has, in the mediæval dialect, two uses to which it is not put at the present day, viz. I. It sometimes marks the subject of a sentence, ex.: *Soregashi no shiyaku wo itashimaseu*, 'I will pour out the wine for you.' II. It is used expletively in an enumeration, like the modern *dano*, ex., (in speaking of horses) *On mumakurabe no, on muma-zorohe no, yabusame no nado*, 'For racing, for parade, for target-practice, etc.'

The interrogative Particle *ka* is often omitted where modern usage would require it, ex., *Nimashite gozaru.—Nita?—Naka-naka.* 'You are like (your father.)' 'Am I?' 'Yes, indeed.'

The termination *sou-na*, indicative of probability or of hearsay report, almost invariably terminates a sentence, instead of forming the attribute of a Noun, which is now its most usual construction. In fact, it corresponds, not to the modern *sou-na*, but to the modern *sou-da*,† ex., *Mesu sou-na*, 'They seem to be calling us.' The kindred modern phrase *sou de* appears as *sou ni*, ex, *Sangu nasaruru sou ni gozaru*, 'I hear you are going on a pilgrimage.'

In such emphatic constructions as *Sake wo oshimi ha senu*, 'I do not in the least grudge my liquor,' the particle *ha* is never replaced by *ya*, as is now the all but universal practice.

The dialect under consideration has a great liking for emphatic and expletive particles at the end of a sentence, —a characteristic which still distinguishes the language of Kiyauto from the Yedo tongue. The following may serve as examples:

Ara! fushigi ya! 'Oh! how extraordinary!'
Ano tei wo shirumai zo, na! 'She can't have a notion 'of the figure she is cutting, can she?

† Compare what has been said above on the subject of *na* as a Substantive Verb.

Digitized by Google

Kaki ha! kaki ha! 'Persimmons! persimmons!'
Iya! suzuki de oriyaru zo ya! 'Why! it is a *suzuki!* (a kind of a fish).
Nau, nau! osoroshi ya no! 'Oh dear! oh dear! how 'alarming!'
Hara ga tatsu yai! 'I am angry, that I am!'
Hito no namida ni, soko kara naku no, uhe kara naku no to ifu koto ga aru kai yai! 'What! do you mean 'to tell me that in crying there is such a thing as 'some of the tears coming from the inside of the 'eyes, and some from the outside?'
Kakesu koto de ha nai wai yai! 'I have not the very 'least intention of letting you go away!'
Oki yoi yai! 'Get up! I tell you!'
Inasu koto de ha nai zoi yai! 'I have not the very 'least intention of letting you go away!'
Motsutainai koto suru wai no! 'Oh! what a shame!'
Nani mono zoi no? 'Who are you, pray?'
Kore kara sasau made yo! 'Well! I'll thrust from 'here!'

Apropos of the above expletive Particles, it may be mentioned that the common modern Yedo word *nee* does not occur in the plays. *Na, naa, no* and *nau*, however, represent it. This may also be the place to insert the only form of swearing that has been met with. It is *Yumi-ya Hachiman!* 'By the god of war with his bow and arrows!'

Other slight peculiarities of construction, etc., will be best appreciated by a perusal of the original and translation, given below, of one of the comedies. Before passing on to the latter, however, it will be convenient here to give a list of all the words that have been met with in the plays having a sense different to that in which modern speakers employ them, together with another list containing words, which, though extremely common in times gone by, have now fallen into disuse,—at least so far as the Yedo dialect is concerned. My excuse for encroaching on a field properly belonging only to the domain of lexicography must be that of practical utility

Digitized by Google

to such as may be desirous of studying the mediæval colloquial tongue, as few of them would find even in a good native teacher a reliable guide to lead them along this specially slippery path.

* *First List* (Words common to the Mediæval and Modern Dialects, but having in each a different signification).†

Anata, 'beyond,' ('you').
Chikagoro, an expletive, ('lately').
Chiyaudo, 'a cupful,' ('just').
Daizhi, 'difficult,' 'important,' ('important' only).
Go kanai, 'your family,' ('your wife').
Hikaheru, 'to have,' besides its other various significations.
Hoyeru, 'to weep,' ('to bark').
Hone wo woru } 'to be tired,' ('to take pains').
Hone ga woreru }
Ichi, 'one,' 'the most,' a superlative Particle, ('one' only).
Ichidan, 'the most,' a superlative Particle, ('one step').
Kami, 'the upper part of the body,' besides its other various significations.
Keshikaranu, 'splendid,' 'successful,' ('monstrous').
Katte, 'the inner apartments,' ('the kitchen').
Kikoyeru, 'to be able to hear,' 'to be audible,' 'to understand,' ('to be able to hear,' 'to be audible' only).
Koshiraheru, 'to get ready,' ('to make ready').
Korayerarenu, 'insupportable,' 'very,' ('insupportable' only).
Mahiru, 'to eat,' 'to drink,' 'to go,' 'to come,' ('to come' only).
Mamoru, 'to keep' 'to buy,' ('to keep' only).
Mesaruru, 'to do' [honorific], = *nasaruru*;—('to be called').

* It is to be observed that in some cases the modern meaning is the more strictly etymological of the two. This is doubtless to be attributed to the great spread of education in later times.

† The version given first, and not placed within brackets, is the mediæval signification. That within brackets is the modern meaning.

Digitized by Google

Mukutsukei, 'unoccupied' ('coarse,' 'barbarous').

Naka-naka, 'yes' (a particle having an adversative signification).

Nai-nai, 'already,' 'beforehand,' but almost an expletive, ('privately').

Nan to, 'how?' = *dou da*.

Nani to zo, 'something or other,' 'please,' ('please only').

Nizhiru, 'to move away,' 'to scribble' ('to creep close to').

O mahe, 'your honourable presence' ('you' to an inferior).

Ottsuke, 'this very instant,' ('a little later').

Rikou, 'joke' ('clever,' 'cute').

Sakana, anything that accompanies a drinking-bout, such as music and dancing ('fish').

Saraba, or more usually *Saraba-saraba*, 'goodbye,' ('if that be so,' 'well then!').

Shinshin, 'vast and quiet' (lonely).

Shiuku, '*jeux de mots*,' '*bons mots*' ('excellent poetry').

Tamaranu, 'very,' ('insufferable').

Temahe, 'presence', 'property' ('you', 'I').

Tonari, 'neighborhood', ('next door').

Toutou, 'quickly', ('at length').

Tsumetai, 'cold to the touch', 'hard-hearted', ('cold to the touch' only).

Useru, a vituperative word for 'to go away', ('to vanish').

Wonna-domo, 'my wife', ('women').

Yusan, 'amusement', ('excursion').

Zhigi, 'diffidence,' 'custom,' 'propriety' ('curtsey').

Zhinshiyaku, 'disagreeable,' ('diffidence').

Second List (Words common in Mediæval Colloquial Japanese, but now obsolete).

Anigo, 'elder brother'.

Anizhiyahito', 'elder brother'.

Danna-mahari, 'visits to parishioners or to customers'.

Fukakarasuru, 'to exaggerate'.

Go bogi sama, 'your mother'.

Digitized by Google

Haregamashii, 'splendid,' 'festive'.
Hima-iri, 'hindrance', 'interruption'.
Hira-ni, 'please', 'certainly', (=modern *mappira*, *zehi*).
Hikidemono, 'presents' (not of eatables) given to inferiors and dependants.
Idzure mo sama, 'all of you', 'all your family'.
Ikafu, 'a great deal'.
Ikana ikana, 'how?' 'in what way?'
Ikana-koto, 'what thing?'
Inasu, 'to send away'.
Itsukado, 'a great deal'.
Jijigo, 'grandfather'.
Kaka sama, 'mother'.
Kakkime, 'that villain'.
Kashimashii, 'noisy'.
Kataguru = modern *katsugu*.
Kirabiyaka-na, 'splendid' (of apparel).
Kochi no hito, } 'my husband'.
Koko no ha, }
Kore no, 'my wife'.
Kosegoto, 'witty allusions', '*jeux-de-mots*'.
Me ga iru } = modern *ki ni iru*.
Me ga yuku }
Muza, 'unfounded', 'unreasonable', 'thoughtless'.
Nagare, 'style', 'school'. (Same Chinese character as modern *riu*).
Nau-nau, 'halloo', etc.
Niyobau-shiyuu, 'your wife' (to an equal).
Nɔseraruru, 'to be deceived'.
Nukaruru, 'to be cheated' (the active *nuku* is rare).
Okosu, 'to give' (= *yokosu*).
Omasu, 'to do' (in the Present Tense there is the alternative form *omasuru*).
On de mɔ nai, 'easy', 'to be taken for granted'.
O tachisugata, 'the figure you cut' (in dancing).
O tachiyari sama ni, = modern *o kaheri-gake ni*.
Oyazhiyamono, 'father.'
Reuji, 'groundless', 'uncalled for', 'rude'.

Digitized by Google

Sakui, 'kind and condescending'.
Samyushii, 'low', 'common', 'coarse'.
Shiyaa, an exclamation, = modern *mua*.
Shiyakei, 'my elder brother'.
Shiyaujin, 'real'.
Suki to (with a Negative Verb), 'not at all'.
Sutsupa, 'a pickpocket'.
Tamafu, 'to give' = modern *kudasaru*.
Tanouta hito } 'my master'.
Tanouta mono }
Temahe-mono, 'a rich man'.
Teito, 'at once', 'without parley'.
Tendau, 'truth'.
Togi, 'companion', 'boon-companion', 'adversary', (at a game).
Totto, = modern *chiyotto*.
Tsu, 'a place full of people'.
Tsukkakete, 'directly', 'personally', 'easily'.
Uchi-kokasu (= *uchi-korobasu*) 'to knock down', 'to throw' (in wrestling).
Uchimi, = modern *sashimi*,
Ukketa (= modern *bakageta*), 'silly'.
Wappa-to, 'in a bawling voice.'
Waro, 'man,' 'person.'
Wassari-to (= modern *assari-to*), 'simple,' 'plain'.
Wasuru (Past *waseta*; no other moods or tenses), 'to come.'
Wodake-dzutsu, 'any vessel for carrying *sake*'.
Yaara, an interjection which = modern *maa*.
Yasurafu, 'to rest.'
Yazen, 'last night'.
Yori-oya dono, 'one standing in the place of a father.'
Zhitsu to, 'truly'.

This second list might be indefinitely prolonged by the insertion of terms of less frequent occurrence, including the, in Japanese, important category of onomatopoetic expressions, the majority of which appear to be, of their nature, extremely fluctuating. Its completion, however, cannot be undertaken here, in a paper already, I fear,

Digitized by Google

very technical and very long. In conclusion, therefore, I merely beg to draw the attention of fellow students to the following text of one of the mediæval comediettas, a glance at which may not only prove of interest to such as occupy themselves with philological studies, but will remove the impression, which the body of the foregoing remarks might tend to create, of the language current during the Middle Ages having been extremely different from that of the present day. At the same time, it may be stated that the play chosen is one of those most modern in its phraseology, and most devoid of difficult passages. It must not be forgotten that the comedies in question are not written entirely in the dialect to which the foregoing observations are meant to apply, and of which the following is a specimen. Besides the colloquial passages, which are the most numerous, we find poetical passages, long prose narrations composed in a style aiming at classicality, and passages mimicking the peculiar language of the *Nou*, or Lyric Dramas, from whose stately measures it was the object of these lighter compositions to unbend the minds of the spectators during a short *entr'acte*. This occasional habit of caricaturing the *Nou*, which sometimes affects a whole play, and, at others, touches but a single phrase, as well as other peculiarities of language and style that are often confined to solitary plays or passages, render it particularly necessary for the student of the mediæval dialect to be beware of trusting to any one comedy lighted on at random as a fair sample of the language of the period in question. To any member of this Society who may wish personally to make further investigations in the subject, I shall be very happy to lend the volumes in my possession. So far as I know, we cannot be said to have any other documents that could greatly add to our knowledge of the Mediæval Colloquial tongue.

Digitized by Google

HONE KAHA—RIBS AND SKIN.

Dramatis Personæ { The Rector of a Buddhist Temple. / His Curate. / Three of the Parishioners.

Scene.—THE TEMPLE.

JIYUUJI—*Kore ha tauzhi no jiyuuji de gozaru. Shinpochi wo yobi-idaite, mafushi-watasu kotoga gozaru. Shinpochi! wisashimasu ka? wiru ka? nau!*

SHINPOCHI.—*Haa! Watakushi wo yobaseraruru ha nanigoto de gozaru zo?*

JIJUUJI.—*Wagoriyo wo yobi-idasu ha betsu no koto de mo nai: gusou mo mohaya toshi yotte, zhiyeki mo taigi zhiya hodo ni, kefu yori tera wo sonata he yudzuru hodo ni, sou kokoroyesashimase.*

SHINPOCHI.—*Katajikenau ha gozaredomo, mada gakumon mo hakabakashiu gozarazu, sono uhe osoute mo osokaranu koto de gozaru hodo ni, kasanete no koto ni nasarete kudasaremasei.*

RECTOR.—I am rector of this temple. I have to call my curate, to make a communication to him. Curate! are you there? are you there? halloo!

CURATE.—Here am I! What is your reason for being pleased to call me?

RECTOR.—My reason for calling you is just simply this: I, unworthy priest, am already stricken in years, and the duties of the temple service weigh heavily upon me. So, do you please to understand that, from to-day, I resign this benefice in your favour.

CURATE.—I feel deeply indebted [to your reverence]. But, as I am still deficient in learning, and as, moreover, no time, however late, would seem too late to me, I beg of you to be so kind as to delay this change.

Digitized by Google

JIYUUJI.—*Ichidan to otonashii henzhi de manzoku itaita. Sari nagara, inkiyo suru to iute, hoya he yuku de mo nai. Sunahachi kono ura ni wiru hodo ni, nan nari to mo, you no koto ga araba, ihashimasei.*

RECTOR.—Nothing could please me more than your most charming answer. But [you must know that], though retiring from the rectorship, I do not intend to leave the temple. I shall simply take up my abode in the back apartment; so, if there should be any business of any kind, please to let me know.

SHINPOCHI.—*Sore naraba, to mo kaku mo giyoi shidai ni itashimaseu.*

CURATE.—Well, if it must be so, I will act in accordance with your august desire.

JIYUUJI.—*Mata, ifu made ha nakeredomo, dannashiyuu no ki ni itte, tera no hanjiyau suru yau ni sashimase.*

RECTOR.—And mind (though it will scarcely be necessary for me to say so) that you do everything in such a manner as to please the parishioners, and make the temple prosperous.

SHINPOCHI.—*O ki-dzukahi nasaremasuru-na! Zuwibun danna-shiyuu no ki ni iru yau ni shimaseu.*

CURATE.—Pray feel no uneasiness [on that head]! I will do things in such a way as to please the parishioners right well.

JIYUUJI.—*Sore naraba, gusou ha mohaya iru hodo ni, kikitai koto ga araba, meshi ni oriyare.*

RECTOR.—Well, then, I retire without further delay. So, if there should be anything you want to ask, come and call me.

SHINPOCHI.—*Kashikomatte gozaru.*

CURATE.—Your commands are laid to heart.

JIYUUJI.—*Mata dannashiyuu no mahirareta naraba, kochi he shirasei.*

RECTOR.—And if any parishioners should call, please to let me know.

SHINPOCHI.—*Kokoroyemashite gozaru.—Sate mo! sate mo! ureshii koto kana! Jiyuuji no itsu tera wo yudzurararuru ka, itsu tera wo yudzurararuru ka to zonzhita tokoro ni, kefu yudzu-*

CURATE.—Your injunctions shall be kept in mind.—Ha! ha! this *is* delightful! To think of the joy of his ceding the benefice to me to-day, just as I was saying to myself 'when will the

Digitized by Google

raruru yau na taikei na koto ha gozatte koso! Dannashiyuu no o kikiyatta naraba, sadamete yorokobi ni oriyarau hodo ni, zuwibun ki ni iru yau ni itasau to zonzuru.

'rector resign in my favour? 'when will he resign in my 'favour?'! The parishioners, when they hear of it, are sure to be charmed; so I mean to manage in such a way as to give them all satisfaction.

ICHI NO DANNA.—*Kore ha kono tonari no mono de gozaru. Saru kata he shiyoyou atte mahiru ga, nihaka ni ame ga furisou ni gozaru hodo ni, danna-dera he tachiyori, kasa wo katte mahirau to zonzuru. Sunahachi kore jiya. Mono mafu'! annai mafu'!*

FIRST PARISHIONER.—I am a resident in this neighbourhood. I am on my way to a certain place on business; but, as it has suddenly begun to threaten rain, I think I will look in at the parish-temple, and borrow an umbrella. Ah! here it is! Hoy! admittance!

SHINPOCHI.—*Iya! omote ni 'mono mafu'!' to aru! 'Annai' to ha tazo,—'mono mafu'!' to ha?*

CURATE.—Oh! there is some one halloing at the gate! Who is that asking for admittance? Who is that halloing?

ICHI NO D.—*Soregashi de gozaru.*

FIRST PAR.—It is I.

SHINPOCHI.—*Kore ha you koso o ide de gozaru!*

CURATE.—Oh! you are indeed welcome!

ICHI NO D.—*Konahida ha hisashiu o mi-mahi mo mafushimasenu ga, o jiyuuji sama ni mo, konata ni mo kaharaseraruru koto mo gozaranu ka?*

FIRST PAR.—It is long since I last had the honour of coming to enquire after you; but I trust that the worthy rector and yourself are still in the enjoyment of good health.

SHINPOCHI.—*Naka-naka! kaharu koto mo gozaranu.—Sate shishiyau no, nani to omoharemashite yara, watakushi ni tera wo yudzurarete gozaru hodo ni, ima made no tohori ni ahi-kaharazu mahiraserarete kudasarei.*

CURATE.—Oh yes! we both continue well. But I must tell you that, moved by some impulse or other, my master has deigned to resign the benefice in my favour. So I pray that you will continue as heretofore to honour our temple with your visits.

Digitized by Google

ICHI NO D.—*Sore ha medetau gozaru. Sate zonzhimaseide, o yorokobi ni mo mahirimasenanda. Sate! tadaima mahiru ha betsu no koto de mo gozaranu: konnichi ha saru kata he mahirimasuru ga, nihaka ni ame ga furisou ni gozaru hodo ni, nani to zo kasa wo kasaserarete kudasareu naraba, arigatau zonzhimasuru.*

FIRST PAR.—That is an auspicious event; and if I have not been [before] to offer my congratulations, it is because I was not apprised of it. Well! my present reason for calling is just simply this: I am off to-day to a certain place; but as it has suddenly begun to threaten rain, I should feel much obliged if you would kindly condescend to lend me an umbrella.

SHINPOCHI.—*Naka-naka! Yasui koto! Kashite shinzhimaseu. Chito sore ni mataserarei.*

CURATE.—Certainly! Nothing easier! I will have the honour to lend it to you. Please wait here an instant.

ICHI NO D.—*Sore ha katajikenau gozaru.*

FIRST PAR.—Oh! very many thanks.

SHINPOCHI.—*Kore, kore! Kore wo kashite shinzhimaseu.*

CURATE.—Here, then! I will have the honour to lend you this one.

ICHI NO D.—*Kore ha katajikenau gozaru.*

FIRST PAR.—Oh! I owe you very many thanks.

SHINPOCHI.—*Mata nan nari to mo, you no koto ga araba, ohoserarei.*

CURATE.—Please always tell me if there is anything of any kind that I can do for you.

ICHI NO D.—*Naka-naka! Tanomimaseu. Mohaya kau mahiru.*

FIRST PAR.—Certainly! I will call in your assistance. [But] now I will be off.

SHINPOCHI.—*Gozarau ka?*

CURATE.—Are you going?

ICHI NO D.—*Naka-naka!*

FIRST PAR.—Yes!

NININ.—*Saraba! saraba!*

BOTH.—Goodbye! goodbye!

ICHI NO D.—*Katajikenau gozaru.*

FIRST PAR.—I am much indebted to you.

SHINPOCHI.—*You gozatta.*

CURATE.—Thanks for your visit.

ICHI NO D.—*Haa,! nau nau! ureshi ya! Isside mahirau to zonzuru.*

FIRST PAR.—Ah! well! that is all right! I will hasten on.

Digitized by Google

SHINPOCHI.—*Dannashiyuu no oriyatta naraba, shirasei to ohoserareta hodo ni, mahitte, kono tohori wo mafusau to zonzuru.—Mafushi! gozarimasuru ka?*

JIYUUJI.—*Iya! oriyatta yo!*

SHINPOCHI.—*Sazo o sabishiu gozarimaseu!*

JIYUUJI.—*Iya! sou mo worinai.*

SHINPOCHI.—*Tadaima tare dono no mahirarete gozaru.*

JIYUUJI.—*Sore ha teramahiri ka? nanzo you ga atte oriyatta ka?*

SHINPOCHI.—*Kasa wo kari ni mahirarete gozaru ni yotte, sunahachi kashimashite gozaru.*

JIYUUJI.—*Sore ha you koso kashimashita. Sari nagara, dono kasa wo kashimashita zo?*

SHINPOCHI.—*Kono jiyuu atarashiu dekite mahitta kasa wo kashimashite gozaru.*

JIYUUJI.—*Wagoriyo ha sosau na hito zhiya! Are ha mada sashi-zome mo senu ni, kasu to ifu koto ga aru mono de oriyaru ka? Kasanete mo aru koto zhiya. Kasumai to omoheba, ifu yau ga oriyaru.*

SHINPOCHI.—*Sore ha nan to mafushimasuru?*

JIYUUJI.—*'O yasui go 'you de ha gozaredomo,*

CURATE.—As he said I was to let him know if any of the parishioners came, I will go and tell him what has passed. Pray! are you in?

RECTOR.—Oh! that is you!

CURATE.—How dull your reverence must be feeling!

RECTOR.—No! I am not dull.

CURATE.—Somebody has just been here.

RECTOR.—Did he come to worship, or was it that he had business with us?

CURATE.—He came to borrow an umbrella; so I lent him one.

RECTOR.—Quite right of you to lend it. But tell me, which umbrella did you lend?

CURATE.—I lent the one that came home new the other day.

RECTOR.—What a thoughtless fellow you are! Would anybody ever dream of lending an umbrella like that one, that had not even been once used yet? The case will present itself again. When you do not want to lend it, you can make an excuse.

CURATE.—How would you say?

RECTOR.—You should say: 'The request with

Digitized by Google

'konahida shishiyau no sa-
'shite ideraremashitareba,
'tsuzhi-kaze ni aharema-
'shite, hone ha hone, kaha
'ha kaha to natte gozaru ni
'yotte, hone kaha tomo ni
'mannaka wo musuude, ten-
'zhiyau he tsuruite oite
'gozaru. Are de ha ye go
'you ni ha tatsumai,' nazo
to, kau nitsukurashiu iute
yaru mono de oriyaru.

'which you honour me is a 'slight one. But a day or 'two ago my master went 'out with it, and, meeting 'with a gust of wind at a 'place where four roads met, 'the ribs flew off on one 'side, and the skin on 'another. So we have tied 'both skin and ribs by the 'middle, and hung them up 'to the ceiling. This being 'so it would hardly be able 'to answer your purpose.' Something like that, something with an air of truth about it is what you should say.

SHINPOCHI.—*Kokoroye-*
mashite gozaru. Kasanete
ha sayau ni mafushimaseu.
—Mohaya kau mahirima-
suru.

CURATE.—Your injunctions shall be kept in mind, and I will make that answer another time.—Now I will be going.

JIYUUJI.—*Oriyarau ka?*

RECTOR.—Are you off?

SHINPOCI.—*Naka-naka.*

CURATE.—Yes.

NININ.—*Saraba! sara-*
ba!

BOTH.—Goodbye! goodbye!

SHINPOCHI.—*Kore ha*
ikana koto? Ikani shishi-
yau no mafusarete mo, aru
mono wo kasaide ha okarete
koso!

CURATE.—What *can* this mean? Let my master say what he likes, it *does* seem strange to refuse to lend a thing when you have it by you.

NI NO DANNA.—*Kore ha*
kono tonari no mono de goza-
ru. Konnichi ha wonro he
mahiru hodo ni, danna-dera
he mahiri, muma wo katte
mahirau to zonzuru.—Isoide
mahirau.—Sunahachi kore
de gozaru. Mono mafu'!
annai mafu'!

SECOND PARISHIONER.—I am a resident in this neighbourhood. As I am going on a long journey to-day, I mean to go to the parish-temple, and borrow a horse. —I will go quickly.—Ah! here it is! Hoy! admittance!

Digitized by Google

SHINPOCHI.—*Mata amote ni 'mono mafu'!' to aru! 'Annai!' to ha tazo,—'mono mafu'!' to ha?*

CURATE.—There is some one halloing at the gate again! Who is that asking for admittance? Who is that halloing?

NI NO D.—*Watakushi de gozaru.*

SECOND PAR.—It is I.

SHINPOCHI.—*Kore ha you koso mahiraserarete gozaru!*

CURATE.—Oh! you are indeed most welcome!

NI NO D.—*Tadaima mahiru ha betsu no koto de mo gozaranu: kefu ha wonro he mahiru ga, chikagoro go mushin ni ha gozaredomo, muma wo kashite kudasareu naraba, katajikenau zonzhimasuru.*

SECOND PAR.—My present reason for calling is just simply this: I am off to-day on a long journey, and (though it is a bold request to make) I should feel much obliged, if you would condescend to lend me a horse.

SHINPOCHI.—*Mottomo o yasui go you de ha gozaredomo, kono jiyuu shishiyau ga sashite ideraremashitareba, tsuzhi-kaze ni aharemashite, hone ha hone, kaha ha kaha to natte gozaru ni yotte, hone kaha tomo ni mannaka wo musuude, tenzhiyau he tsuruite oite gozaru hodo ni, are de ha ye go you ni ha tachimasumai.*

CURATE.—Nothing could be slighter than the request with which you honour me. But a day or two ago my master went out with it, and meeting with a gust of wind at a place where four roads met, the ribs flew off on one side, and the skin on another. So we have tied both skin and ribs by the middle, and hung them up to the ceiling. This being so, it would hardly be able to answer your purpose.

NI NO D.—*Iya! muma no koto de gozaru!*

SECOND PAR.—Why! it is a horse that I am asking for!

SHINPOCHI.—*Naka-naka! muma no koto de gozaru.*

CURATE.—Yes, certainly! a horse.

NI NO D.—*Haa! sore naraba, zehi ni oyobimasenu. —Mou kau mahirimasuru.*

SECOND PAR.—Oh well! then there is no help for it. —I will be off.

SHINPOCHI.—*Gozarau ka?*

CURATE.—Are you going?

NI NO D.—*Naka-naka.*

SECOND PAR.—Yes.

Digitized by Google

NININ.—*Saraba! saraba.*

BOTH.—Goodbye! goodbye!

SHINPOCHI.—*You gozatta.*

CURATE.—Thanks for your visit.

NI NO D.—*Haa! hate sate! Gaten no yukanu koto wo mafusaruru!*

SECOND PAR.—Well! I never! He says things that I cannot in the least make out.

SHINPOCHI.—*Shishiyau no woshiherareta tohori wo mafushita hodo ni, sadamete kigen ga you gozarau.—Mafushi! Gozarimasuru ka?*

CURATE.—I spoke as my master had instructed me; so doubtless he will be pleased. Pray! Are you in?

JIYUUJI.—*Iya! oriyatta yo! Nanzo you de bashi oriyaru ka?*

RECTOR.—Oh! that is you! Is it on business that you come?

SHINPOCHI.—*Tadaima tare dono no muma wo kari ni mahiraremashite gozaru.*

CURATE.—Somebody has just been here to borrow our horse.

JIYUUJI.—*Saihai hima de wiru yau ga, kashimashita ka?*

RECTOR.—And you lent him, as he fortunately happened to be disengaged?

SHINPOCHI.—*Iya! saizen konata no ohoserareta tohori wo mafushite, kashimasenanda.*

CURATE.—Oh no! I did not lend it, but replied in the manner you had taught me.

JIYUUJI.—*Iya! gusou ha muma no koto ha oboyenu ga, nan to iute yarashimashita?*

RECTOR.—What! I do not remember saying anything about the horse! What was it you answered?

SHINPOCHI.—*Kono jiyuu konata no sashite iderare-mashitareba, tsuzhi-kaze ni aharemashite, hone ha hone, kaha ha kaha to natte gozaru hodo ni, are de ha ye go you ni ha tatsumai to mafushite gozaru.*

CURATE.—I said that you had been out with it a day or two ago, and that, meeting with a gust of wind at a place where four roads met, the ribs had flown off on one side, and the skin on the other, which being the case, it would hardly be able to answer his purpose.

Digitized by Google

JIYUUJI.—*Kore ha ikana koto! Kasa wo kari ni kita naraba, sou iute yarashimase to iutare!* Muma wo kari ni kita ni sono yau na koto wo iute yaru to ifu koto ga aru mono de oriyaru ka? Mata, muma mo kasumai to omoheba, ifu yau ga oriyaru.*

RECTOR.—What *do* you mean? It was if they came to ask for an umbrella that I told you to reply like that! [But] would anybody ever dream of saying such a thing to a person who should come to borrow a horse? Another time, when you do not want to lend it, you can make a [fitting] excuse.

SHINPOCHI.—*Sore ha nan to mafushimasuru?*

CURATE.—How would you say?

JIYUUJI.—*'Kono jiyuu 'haru-kusa ni tsukete oite 'gozareba, da-guruhi wo 'itaite, koshi no hone wo 'uchi-wotte, muma-ya no 'sumi ni wara wo katsuide 'nete wimasuru. Are de ha 'ye go you ni ha tatsumai,' nazo to, kau nitsukurashiu iute yaru mono de oriyaru.*

RECTOR.—You should say: 'We lately turned 'him out to grass; and, be-'coming frolicsome, he dis-'located his thigh, and is 'lying down covered with 'straw in a corner of the 'stable. This being so, he 'will hardly be able to 'answer your purpose.' Something like that, something with an air of truth about it, is what you should say.

SHINPOCHI. — *Kokoroye-mashite gozaru. Kasanete ha sayau ni itashimaseu.*

CURATE.—Your injunctions shall be kept in mind, and I will make use of them next time.

JIYUUJI.—*Kanarazu so-kotsu na koto wo ihashima-su-na!*

RECTOR.—Be sure you do not say something stupid!

SHINPOCHI.—*Kore ha i-kana koto? Ihe to oshiyaru ni yotte iheba, mata shika-raruru zhiya made! Midomo no mi ni natte mo, meiwaku itasu koto zhiya.*

CURATE.—What *can* this mean? To say a thing because he tells me to say it, and then, forsooth, to get a scolding for it! For all I am now my own master, I see no way out of these perplexities.

---

* This use of the perfect without a preceding *koso* is remarkable. Possibly *koso* has been wrongfully omitted by the copyist.

Digitized by Google

SAN NO DANNA.—*Kore ha kono tonari no mono de gozaru. Danna-dera he shiyoyou atte mahirau.—Iya! mahiru hodo ni, sunahachi kore zhiya. Mono mafu'! annai mafu'!*

SHINPOCHI.—*Mata omote ni 'mono mafu'!' to aru. 'Annai!' to ha tazo,—'mono mafu'!' to ha?*

SAN NO D.—*Soregashi de gozaru.*

SHINPOCHI.—*Kore ha you koso idesaserarete gozaru!*

SAN NO D.—*Konahida ha hisashiu o mi-mahi mo mafushimasenu ga, o jiyuuji sama ni mo, konata ni mo kaharaseraruru koto mo gozaranu ka?*

SHINPOCHI. — *Naka-naka! kaharu koto mo gozaranu ga, sore ni tsukete shishiyau no nan to omoharemashite yara, gusou ni tera wo yudzurarete gozaru hodo ni, ahi-kaharazu mahiraserarete kudasarei.*

SAN NO D.—*Sore ha medetau gozaru. Zonzhimaseide o yorokobi ni mo mahirimasenanda. Miyaunichi ha kokorozashi no hi de gozaru hodo ni, o jiyuuji sama ni mo, konata ni mo o ide nasarete kudasareu naraba, katajikenau zonzhimasuru.*

THIRD PARISHIONER.—I am a resident in this neighbourhood, and am on my way to the parish-temple, where I have some business. —Well, I will make haste.—Ah! here I am! Hoy! admittance!

CURATE.—There is some one hallooing at the gate again! Who is that asking for admittance? Who is that hallooing?

THIRD PAR.—It is I.

CURATE.—Oh! a hearty welcome to you!

THIRD PAR.—It is long since I last had the honour of coming to enquire after you; but I trust that the worthy rector and yourself are still in the enjoyment of good health.

CURATE.—Oh yes! we both continue well. But, by the way, my master, moved by some impulse or other, has deigned to resign the benefice in my favour. So I pray that you will continue to honour our temple with your visits.

THIRD PAR.—That is an auspicious event; and if I have not been already to offer my congratulations, it is because I was not apprised of it.—To-morrow being a religious anniversary [in my family], I should feel greatly obliged if our worthy rector and yourself would condescend to come [to my house].

Digitized by Google

SHINPOCHI.—*Watakushi ha mahirimaseu ga, shishiyau ha ye mahiru koto ha narimasumai.*

SAN NO D.—*Sore ha nan zo o hima-iri de mo gozaru ka?*

SHINPOCHI.—*Betsu ni hima-iri mo gozaranu ga, kono jiyuu haru-kusa ni tsukete gozareba, da-guruhi wo itaite, koshi no hone wo uchiwotte, muma-ya no sumi ni, wara wo katsuide, nete wo-raremasuru. Are de ha ye mahiru koto ha narimasumai.*

SAN NO D.—*Iya! o jiyuuji sama no koto de gozaru!*

SHINPOCHI.—*Naka-naka! shishiyau no koto de gozaru.*

SAN NO D.—*Sore ha kinodoku na koto de gozaru. Sore nareba, konata ni idesasaserarete kudasarei.*

SHINPOCHI.—*Naka-naka! watakushi ha mahirimaseu.*

SAN NO D.—*Mohaya kau mahiru.*

SHINPOCHI.—*Gozaru ka?*

SAN NO D.—*Naka-naka.*

NININ.—*Saraba! saraba!*

SHINPOCHI.—*You gozatta!*

SAN NO D.—*Haa! hate sate! Gaten no yukanu koto wo mafusaruru!*

CURATE.—For myself, I will come, but my master will scarcely be able to do so.

THIRD PAR.—What! has he any other business on hand?

CURATE.—No! he has no particular business on hand; but we lately turned him out to grass; and, becoming frolicsome, he dislocated his thigh, and is lying down covered with straw in a corner of the stable. This being so, he will scarcely be able to come.

THIRD PAR.—Why! it is the rector that I am talking about!

CURATE.—Yes, certainly! the rector.

THIRD PAR.—Well! I am sorry such a thing should have occurred. At any rate, do you, please, be so kind as to come.

CURATE.—Most certainly, I will come.

THIRD PAR.—Now I will be off.

CURATE.—Are you going?

THIRD PAR.—Yes.

BOTH.—Goodbye! goodbye!

CURATE.—Thanks for your visit.

THIRD PAR.—Well, I never! He says things that I cannot in the least make out.

Digitized by Google

SHINPOCHI.— *Kondo ha, ika nari to mo, kigen de gozzrau. Mafushi! gozarimasuru ka!*

CURATE.—This time, at all events, he will be pleased. —Pray! are you in?

JIYUUJI.—*Iya! oriyatta yo! Nan zo you de bashi oriyaru ka?*

RECTOR.—Oh! that is you! Is it on business that you come?

SHINPOCHI.—*Tadaima tare dono no mahirarete gozaru ga, miyaunichi ha kokorozashi no hi de gozaru hodo ni, konata ni mo, watakushi ni mo mahiru yau ni to mafusarete gozaru ni yotte, watakushi ha mahirau ga konata ni ha ye gozaru koto ha narumai to mafushite gozaru.*

CURATE.—Somebody has just been here to ask both your reverence and myself to go to him to-morrow, when there is a religious anniversary [in his family]. So I said that I would go, but that you would scarcely be able to do so.

JIYUUJI.—*Saihai asu ha hima zhiya ni yotte, yukau mono wo.*

RECTOR.—What a pity! I should have liked to have gone, as I just happen to be at leisure to-morrow.

SHINPOCHI.—*Iya! konata no ohoserareta tohori wo mafushite gozaru.*

CURATE.—Oh! but I said what you had instructed me to say.

JIYUUJI.—*Midomo ha oboyenu. Nan to iute yarashimashita zo?*

RECTOR.—I do not remember. What was it, then, that you answered?

SHIPOCHI.—*Kono jiyuu haru-kusa ni tsukete gozareba, dagurui wo itaite, koshi no hone wo uchi-wotte, mumaya no kado ni wara wo katsuide, nete wororaremasuru. Are de ha ye mahiru koto ha narimasumai to mafushite gozaru.*

CURATE.—I said that we had lately turned you out to grass, and that, becoming frolicsome, you had dislocated your thigh, and were lying down covered with straw in a corner of the stable, so that you would scarcely be able to go.

JIYUUJI.—*Sore ha shinzhitsu iute yarashimashita ka?*

RECTOR.—You really and truly went and said that?

SHINPOCHI.—*Naka-naka! shinzhitsu de gozaru.*

CURATE.—Yes! really and truly.

JIYUUJI.—*Hate sate! Wageriyo ha don na hito*

RECTOR.—Well, I never! You *are* an idiot! Speak

Digitized by Google

zhiya! Iute mo, iute mo, gaten ga yukanu sou na. Sore ha muma wo kari ni waseta naraba, sou ihe to koso iutare! Sono yau na koto de shiyosen tera wo motsu koto ha narumai. Idete o yukiyare!

as I may, over and over again, nothing seems to be able to make you understand. It was if they came to borrow a horse, that I told you to make that answer! The end of all this is, that it will never do for you to become rector. Get along with you!

SHINPOCHI.—*Aa!*

CURATE.—Oh!

JIYUUJI.—*O yukiyarumai ka? O yukiyarumai ka? O yukiyarumai ka?*

RECTOR.—Won't you get along? Won't you get along? Won't you get along?

SHINPOCHI.—*A ita! a ita! a ita! a ita! a ita! Nau! gobou! ikani shishiyau zhiya to iute, sono yau ni uchi chiyauchiyaku suru koto ga oriyarau ka? Sonata zhiya to iute, da-guruhi wo mesarenu koto ha oriyarumai zo!*

CURATE.—Oh dear! oh dear! oh dear! oh dear! oh dear! But, reverend Sir, for all you are my master, it is an unheard of shame for you to beat me thus. And for all you are the man you are, you cannot be said to have been without your frolics, either,—that you cannot.

JIYUUJI.—*Itsu midomo ga da-guruhi wo shita koto ga aru zo? Arau naraba, hayau ihe, hayau ihe!*

RECTOR.—When was I ever frolicsome? If I ever was, out with it quick! out with it quick!

SHINPOCHI.—*Mafushita naraba, menboku ga gozarumai.*

CURATE.—If I were to tell it, you would be put to shame.

JIYUUJI.—*Menboku wo ushinafu oboye ha nai. Araba, hayau ihe, hayau ihe!*

RECTOR.—I am conscious of nothing that could put me to shame. If anything there be, out with it quick! out with it quick!

SHINPOCHI.—*Sore naraba, mafusu zo ya!*

CURATE.—Well then, I'll tell it, I will.

JIYUUJI.—*Hayau ihe!*

RECTOR.—Out with it quick!

SHINPOCHI.—*Sore, itsuzoya monzen no Ichi-ya ga mahitta.*

CURATE.—Well, then! the other day, Betsy, who lives outside the temple-gate, was here.

Digitized by Google

JIYUUJI.—*Sono Ichi-ya ga nan to shita zo?*

SHINPOCHI.—*Madzu kikaserarei! Te-maneki wo shite, mensou he tsurete o hairiyatta ga, nan to are ha da-guruhi de ha nai ka?*

JIYUUJI.—*Onore ha nikui yatsu no nai mo senu koto wo iute, shishiyau ni haji wo kakasuru! Kono uhe ha, Yumi-ya Hachiman! nogasu koto de ha nai zo!*

SHINPOCHI. — *Shishiyau zhiya to iute, makuru koto de ha gozaranu.*

NININ.—*Iya! iya! iya!*

SHINPOCHI.—*Oboyeta ka? Nau, nau! ureshi ya no! ureshi ya no! Katta zo! katta zo!*

JIYUUJI. — *Yai! yai! Shishiyau wo kono gotoku ni shite, dochi he yuku zo? Hito ha nai ka? Torahete kurei! Yarumai zo! yarumai zo!*

RECTOR.—And what about Betsy, pray?

CURATE—Just listen, please! Don't you call it a frolic to have beckoned to her, and then to have taken her into the bedroom?

RECTOR.—Insolent rascal, inventing things that I never did, and bringing shame on your superior! After this, by the God of War with his Bow and Arrows, I shall not let you escape me!

CURATE.—For all you are my master, I do not intend to let myself get the worst of it.

BOTH.—Ah! ah! ah! (*fighting*).

CURATE.—Has the old fool learnt a lesson? Oh! oh! I *am* glad! I *am* glad! I've beat! I've beat!

RECTOR.—Deary, deary me! where is he off to after having put his master in such a plight? Is there nobody there? Catch him! I won't let him escape! I won't let him escape!

Digitized by Google

ASIATIC SOCIETY OF JAPAN.

A special General Meeting was held in Tôkiyô on Saturday, 18th May, Sir Harry S. Parkes, President, in the chair.

The President in opening the Meeting said that the special business before them was to take action upon the preliminary draft of the rules which had been presented to the Society at the last Meeting in Tôkiyô. This draft was to be considered as a joint report of the Committee appointed by the Society and of the Council. The subject had occupied their attention for several Meetings, and was now ready for discussion. He proposed that the sense of the meeting be taken on each rule.

The consideration of each clause was then proceeded with, some alterations being made, but the general spirit of the draft was approved of.

After the rules had been discussed seriatim the draft as amended was passed as a whole.

Mr. Grigsby gave notice that at the next General Meeting in Tôkiyô, he would propose the following motion:—"That the representatives of the Foreign Press be admitted to the meetings of the Society"

The meeting was then adjourned until Saturday, 25th instant.

Digitized by Google

Digitized by Google

ASIATIC SOCIETY OF JAPAN

A General Meeting was held in Tôkiyô on Saturday, 25th May, Sir Harry S. Parkes, President in the Chair.

The Minutes of the previous meeting having been taken as read, the election of the following gentlemen as members of the Society was announced: Messrs. D. W. Stephens, W. Houghton, and the Revd. Dr. L. Gulick.

Mr. Grigsby then proposed the motion, of which he had given notice, "That the representatives of the foreign press of Japan be admitted to the meetings."

This was seconded by Dr. Eldridge, but was afterwards amended by striking out the word 'foreign,' and after some discussion was put to the meeting and carried.

In order to give effect to Mr. Grigsby's motion, Mr. Dallas moved, that the words 'including representatives of the press' be inserted in rule 22, after the word 'visitors.' Seconded by the Revd. J. L. Amerman, and carried.

Messrs. Bramsen, Terry, and Marshall were appointed to draw up, in conjunction with three members of the council and three others to be appointed at Yokohama, a list of proposed officers and members of council for the ensuing year.

Dr. Faulds made the following remarks: The vegetable production now shown, was found last September covering the bottom of the rice field, at a village called Ise Suzuku in Miye Ken, and was sent to me for examination.

It is of a dull white colour, faintly tinted in some parts with greenish yellow and has quite the appearance of ordinary raw cotton. It is said to occur in considerable quantities. The fibres are very fine, but short and rather brittle and are heard to break with a peculiarly crisp crackle when held close to the ear. This fact I was led to observe from the singular structure of this substance as revealed by the miscroscope.

It was in a dried state when received by me, and resembled a net work of interwoven crystal chains with elongated hexagonal links joined end to end but so that their flat surfaces and edges were alternately exhibited to the observer.

The links, or cells, were hollow but their walls were lined in the interior with adherent particles of somewhat angular and often of almost crystalline shapes. I found that the fracture of the fibres did not take place nearly so often at the joining of the cells as one would have expected, and quite frequently the cells were broken across through their centres. The only notice of any similar production I can find at present is in the Quart. Journ. of Micros Sc. Vol. X, p. 203. The specimen there described was found in an Irish bog, resembled cotton wadding, and was abundant enough to have

Digitized by Google

been used for packing. It was believed to be a rare Œdogonium, but no microscopic description is given, nor is the species exactly named. It is not at all unlikely that the specimen just described is of the same, or of a very closely allied species.

Mr. Chamberlain then read a paper on the "Colloquial dialect of the Middle ages."

Mr. Satow observed that the members of the Society were much indebted to Mr. Chamberlain for the interesting specimen of dramatic literature to which he had introduced them, and also for his valuable analysis of the philological peculiarities of the dialect in which these little comedies were written. The study of dialects was of the greatest importance, as it enabled problems of etymology to be solved which otherwise could have been only guessed at. For instance, the attachment of *aru* and *oru* directly to the root of a verb, which Mr. Chamberlain had pointed out as one of the characteristic features of the comedy dialect, went far to confirm Mr. Aston's view that the perfect in *eri* was formed by contraction of the final *i* of a verbal root with *ari*. Thus *amefuri ari* which is actually found to exist in the mediæval dialect, was evidently the origin of *ame fureri*, and the theory usually held by Japanese grammarians that it was a condensation of *furiterai* was thereby proved to be erroneous. It appeared to him that the modern Kiyauto dialect resembles in many particulars that of the comedies as described by Mr. Chamberlain. The verb *goza*, to be, etc., found first in the comedies had a curious origin. There was formerly in use a highly honorific substantive verb *owashimasu*, which when written was represented by the Chinese characters 御座, the 'pronunciation' of which was *goza*. To this verb was ordinarily added the verb *sôrô*, to be, thus, *owashimashi sôrô*, but after a while, owing to the tendency to look upon the Chinese equivalent as more elegant than the primitive Japanese word, it became customary to read *goza sôrô* instead of *owashimashi sôrô*, and a corresponding colloquial phrase also came into use *goza aru* or *gozaru*. At Ozaka, however, instead of *goza*, the form *omashi* was used, which was a retranslation of 御座 by the common honorific *o* and *mashi* to be. Thus both *gozaru* and *omasu* had sprung from the some origin.

The President remarked on the philological value of Mr. Chamberlain's paper, and also on the ethnological importance of the study of the early literature of the Japanese, not only of the mediæval time but also that of a more ancient date. He alluded to the previous contributions of Mr. Chamberlain and Mr. Aston in this comparatively unexplored field of research, and hoped that it would continue to receive their attention and that of other competent members of the Society. In closing the proceedings he moved a vote of thanks to Mr. Chamberlain for the essay just read, which was cordially carried by acclamation.

Digitized by Google

SOME SCENES BETWEEN THE ANCIENT AND THE MODERN CAPITALS OF JAPAN.

BY

W. G. DIXON, Esq.

Read before the Asiatic Society of Japan, on the 8th June, 1878.

Two great highways connect the eastern and western capitals of Japan, the Tôkaidô, which follows for the most part the coast line, and the Nakasendô or Kisokaidô, which, issuing from Yedo in a north-westerly direction, traverses the great plain between that city and the flourishing town of Takasaki, and thence bending westward is soon threading the mountains of the interior. Running almost due westward out of Yedo, and thus for the first portion of its course almost equally distant from the Tôkaidô and the Nakasendô is another important road, the Kôshiukaidô, so called after the province Kôshiu or Kai, which it brings into communication with the capital. As the Nakasendô ultimately takes a more westerly direction than that in which it emerges from the city, so this road, after reaching the mountains of Kai, bends towards the north; and the two meet at the town of Shimonosuwa, distant from Yedo about 137 miles by the Kôshiukaidô and a few miles more by the Nakasendô.

The following paper contains a few notes of a journey that I took last year in company with a friend, along the

Digitized by Google

whole length of the Kôshiukaidô to Shimonosuwa, thence by the Kisokaidô as far as Oï, where we diverged in order to visit Nagoya; from which city the Tôkaidô afforded us a ready route to Kiyôto. While an endeavour has been made to avoid making it too much of an itinerary, the admission of the somewhat heterogeneous topics of which it treats is justified only by the circumstance that these were suggested by places visited in our tour. It is only in virtue of this fact that these notes can present any claim to unity.

It was early on the morning of the 11th of July last, and rain was falling heavily, when we left Kanda Bashi, Yedo, in the coach for Fuchu, and, rumbling through the castle grounds and the populous suburb of Kôjimachi, at length emerged upon the open plain. Labouring along ruts, struggling up slopes and through hollows, we made our way, past bamboo groves and thatched cottages with wondering children, by clustering pines, and between fields of young rice; stopped for a minute half-way to receive tea from the hands of a blooming damsel; and at ten o'clock reached Fuchu, still in rain. By the time we were crossing the broad pebbly bed of the Tamagawa, embanked with its tiers of stone fascines, the mist was leaving the slopes of the range of Ôyama, that lay with softly shaded green in front of us. But five miles now separated us from Hachiôji, at which town we duly arrived.

The district which we were now entering is one of the principal silk-producing regions of Japan; Hachiôji may be considered its centre. This town consists for the most part of one long broad main street lined with a goodly array of substantial shops. In almost every house we could see women busily plying the loom or in basins of hot water unwinding cocoons, sometimes singly or in small groups in private dwellings, more rarely in larger numbers in small factories. There were evidences also of some trade being done in the manufacture of indigo dye.

The road from the town towards the hills leads through

Digitized by Google

a well cultivated region between fields ranged with lines of mulberry trees and past cozy little villages, all bearing signs of industry, mothers and elder sisters busy with the cocoons, while the children, dressed in the garb of nature, roll upon the mats or engage in play outside. Wooded hills presently begin to appear on each side, and gradually increase in number, until the traveller finds himself ascending the pass of Kobotoké. The zig-zag path is steep, but the summit is soon reached, from which he can look back upon his route, beyond foreground pines, between grassy hills, away over undulating patches of woodland, to the plain, until it merges in the vapoury clouds, or, if the weather be clear, stretches to the blue waters of the sea. On the other side of the pass, a profusion of darkly wooded mountains rise closely together, but, as the descent is made, the scene opens out, revealing the deep ravine of the Katsuragawa flanked by plateaus covered with fields of grain, which again are overhung by high hills. The village of Obara, situated on one of these table-lands, lies at the foot of the pass, and after leaving it the road winds picturesquely up the left bank of the stream at one time high above its bed, at another on the edge of its rapid current. At one point an all but perpendicular precipice is descended by a zig-zag path to the river, which is crossed by a ferry-boat attached to a rope slung across the channel; only a few yards further the stream has to be recrossed and a similar declivity ascended.

It was interesting to observe the fishing for *ai*, a small trout-like fish, which seemed to be carried on extensively in the Katsuragawa. The method of alluring the fish was to take a live *ai* and fix it by the mouth to a line attached to a rod. The motions of this fish attracted other members of its species, for the reception of which some not very visible hooks had been placed close to the line.

For many miles the road continued in this way, now skirting plateaus between lines of mulberry shrubs, now descending into a little valley, silent but for the intermit-

Digitized by Google

tent moan of its sequestered waterwheel. Beyond Notajiri it left the river for some distance and rose gradually but considerably, passing close to the sighing pine-woods that flecked the hills. On the north, to our right, lay a ridge of soft green mountains, beneath us in the most picturesque confusion, plateaus, villages, patches of rice-fields in hollows, higher up many-wrinkled hills, and beyond all the queenly cone of Fuji-san, typical, as it penetrated the upper heaven, of serene peace as contrasted with the restlessness suggested by the wave-like contour of the lesser heights beneath it. Descending and ascending, crossing brooks and winding along slopes, we continued on our way, until we came to a rest-house overhanging a precipice near Omomura. From this place we commanded a magnificent prospect of the whole mountain land which we had crossed, hills rising out of hills away to the east, until an angular break revealed a portion of the horizon line of the outer plain.

Not the least interesting spot in this beautiful region is Sarubashi. This village lies on the right bank of the Katsuragawa at a point where that stream flows silently through a narrow gorge. This is crossed by a wooden bridge of somewhat peculiar construction, the distance between which and the river we found by calculation to be 110 feet. The grey sides of the ravine are adorned above with pleasant foliage, but descend sheer and bare to the dark green waters of the stream.

At Otsuki the road takes a sudden bend to the right (in the opposite direction branches the road to Yoshida at the base of Fujisan), and, crossing the Katsuragawa again, threads the narrow and deeply wooded valley of the Sasagogawa, a typical mountain torrent. Leaving the village of Kuronoda, we followed a path almost obscured with copsewood, which gradually became steeper, until we were traversing the pass of Sasago. Wild luxuriance of vegetation was the leading characteristic of the scenery. All around was a profusion of magnificently wooded mountains. In the valley no dwellings were to be seen, nothing but pine-woods and undulations covered with

Digitized by Google

dense thickets, through which could be caught glimpses of a mountain torrent as it leapt on to join the river that was to bear it to the sea. On the other side of the pass, appeared in the distance the lofty blue range of Koma-ga-také. Between the villages of Koma-ga-yeki and Katsunuma the road commanded an ever extending view of the most sublime character. On our left lay a magnificent gorge, along the deep bottom of which, many hundred feet beneath us, rushed the foaming waters of the impetuous Mikawa. The slopes of the hill terraced by the road were planted with vineyards, the trellis-work that supported the plants standing out against the summer sky. In front stretched the fertile plain of Kôfu, delicate green variegated with dark clumps of trees and studded with villages each with its white-towered school. More distant, when the greenness of the plain had assumed a more bluish tinge, rose like a huge barrier the lofty streaked ridge of Koma-ga-také with thin lines of fleecy clouds slowly sailing near its summit. The smiling plain environed with its grand hills and bearing on its surface the signs of civilization presented, as it sparkled in the noonday sun, a most striking picture of peace and prosperity.

In the afternoon, which was intensely hot, we proceeded along the plain to the town of Kôfu, our attention being attracted by the neat schools and police stations, most of them surmounted by drum-towers, that on all sides gave quite a western appearance to the fair champaign. The summit of Fuji again came into view, rising behind a wall of mountains that formed the plain's southern boundary.

The town of Kôfu, the capital of the province of Kôshiu and the seat of the local government of Yamanashi ken, is most picturesquely situated near the centre of this hill-encircled plain. The population is said not to exceed 12,000, but the buildings are substantial and the streets for the most part broad and regular. One portion of the town contains so many buildings in European style that it looks quite like a foreign settlement. The shops are handsome, and everywhere there are signs of prosperity

Digitized by Google

and progress. As we took a stroll through the town on the evening of our arrival the dark green mountains that formed a tall background to the vistas of the streets, presented exquisite shading in the rays of the setting sun, especially when the empurpled summit of Fuji-san rose in contrast behind them.

On the north side of Kôfu, and just outside its limits, lies the castle of Kôfu, or rather its site, with the moat and stone-works in a state approaching picturesque ruin. This castle is said to have been built 300 years ago by Taketa Shingen, a warrior of some note in Japanese history. In 1875, Mr. Isékatsu, a merchant in Yedo, desiring to utilize a portion of the ground covered by lake Suwa for the cultivation of rice, undertook to drain off some of the water of that lake. While workmen were engaged in this operation, they came upon a skeleton, and near it a stone the name and date on which left no doubt that the remains were those of the celebrated founder of Kôfu castle.

From the castle grounds a good panoramic view of the town is obtained. Prominent in the foreground are the long white buildings of the silk factory, more distant and further west rises the circular tower of the Shihan-gakkô, or Normal school; several other large white buildings attract the eye, such as the National Bank, the Girls' school, the Government offices, and more than one police-station; while an unusually large proportion of godowns gives a greater air of substantiality than is characteristic of the majority of Japanese cities. Although the castle buildings are in a state of collapse, the grounds are not allowed to lie waste. We had the pleasure of being introduced to several of the leading men of the town, who showed us the greatest kindness and took considerable trouble in bringing before our notice the different sights of the place. Among them was a gentleman who had spent eight years in California in the study of fructiculture and wine-making. He had laid out large spaces of the ground within the moat for the cultivation of many different kinds

Digitized by Google

of fruits imported from America,—apples, pears, plums, peaches, gooseberries, grapes, &c., as well as numerous species of vegetables. He had also a building devoted to the making of brandy and of light and dark wines; and in a neighbouring pasturage were several cows that supplied fresh milk every morning to such of the inhabitants as desired to use it.

The silk factory, which is in the hands of the Government, consists of extensive buildings, and employs 200 operatives. The machinery is driven by water-power. The day of our visit happened to be a holiday, so that we had not an opportunity of seeing the operatives at work; but we passed through the long principal building with its double line of metal basins overhung by glass spirals in which the silk is reeled from the cocoons. Some very fine specimens of rock-crystal from the neighbouring mountain of Mitaké, most of them cut into shapes to suit the foreign market, were also here shown to us.

Through the kindness of its principal, we visited the Normal School. Although in the unsatisfactory lath and plaster style of modern Japanese architecture, it has an appearance of some imposingness. The main building consists of three wings, the central one of three stories and surmounted by a tower, the others of two. Inside there is a large airy examination hall, and the various class-rooms are well-fitted; the seats, indeed, struck me as being more comfortable than those of some of our own schools in England. The dormitory and infants' school are detached, and there is a spacious recreation ground furnished with various gymnastic appliances. The principal informed me that the institution had 14 teachers, each having a special branch to teach, and 122 pupils. He further informed me that in Yamanashi *Ken*, the smallest in the empire, there were 270 schools with 13,000 scholars.

We witnessed a further sign of the enlightenment of this progressive little city in the office of its daily paper, the Kôfu Mainichi Shimbun; and we closed an interesting day by visiting through the moonlight, in company

Digitized by Google

with our friends, the pretty public gardens with their temples and summer-houses, that lie at its north-eastern limit.

It was with some regret that we parted next morning from our hospitable and enlightened friends, and as we looked back upon this attractive inland town, we expressed our hearty well-wishes for its prosperity. We passed over the plain through the summer sunlight, Fuji in our rear appearing to be watching our course from behind the southern hills, as we cut across a smiling expanse of gentle undulations towards an opening in the northwestern heights. After passing through several villages and making a slight ascent, we began to descend into a broad valley watered by two streams, the granite beds of which flashed white in the sun's rays, presenting a striking contrast to the density of foliage around. Through a break in the hills on the horizon in front of us could be seen the gently rising lower slope of Yatsu-ga-také, and as we proceeded more of that mountain came into view. Presently we were ascending the left bank of the more westerly of the two rivers referred to ; on our left rose a fine range of shadow-embracing hills, on our right was a long green bluff averaging 150 or 200 feet in height, which latter evidently separated the courses of the twin streams. For many miles the road was very solitary. The river whose margin we were following rushed with rapid current among boulders of fine white granite ; at several places its banks were strengthened with stone fascines. There was one scene in this valley that struck me as being remarkably like what one might meet with in the Highlands of Scotland. We were crossing the river's bed ; in front was a new two-story school suggesting a new hotel, and the mountains and rapids were not less suggestive. Higher up the valley the rafts were shooting the rapids as we passed ; one man in front steered by means of an oar arranged somewhat like a rudder, while another plied a pole behind. After passing through a few villages we approached a curious table land, quite artificial-looking

Digitized by Google

in its regularity, which rose from the centre of the valley. On the summit appeared conspicuously a monument not unlike a Druidical stone. To the top of this plateau the road led, and on reaching it we saw about half a mile in advance the village of Dai-ga-hara with its stone-covered roofs nestling among trees, and having as their background the deeply wooded ridge of Koma-ga-také.

It is from one of the lower spurs of this mountain that there issues a cascade of surpassing beauty, called Koma-ga-taki. Being informed by the inhabitants of its existence, we resolved to visit it early next morning. Diverging to the right from the high road ere we had reached the further end of the village we walked through fertile wooded land with a charming view of the grove-enveloped heights until we reached the bed of a broad mountain torrent. The left bank of this we ascended for a short distance but at a bend overlooked by a number of stone idols we went down into the channel and commenced to ascend it by leaping from boulder to boulder. A few minutes brought us to the cascade, the first glimpse of which convinced us that we had done well to visit it, even at the expense of a short delay in our journey. It consists of three falls, the uppermost, about fifty feet in height, gushing out between light grey rocks as if from the interior of the mountain, for the course of the river above is oblique to the face of the cliff, and consequently no portion if it is seen until it makes the leap; then follows a pool of perhaps 50 feet in length, below which are two very much shorter falls and another deep pool. I am unable to give the height accurately as we could see no means of reaching the top of the highest fall. There were only two ways of reaching its base, either by scrambling at considerable risk round the corner of a precipice or swimming across the lower pools and climbing the lesser falls by rocks that lay out of the main current. The latter method I found much more convenient. It would be vain to attempt to describe the extreme picturesqueness of Koma-ga-taki. Above the brink of the precipice down which the silvery water leaps, the moun-

Digitized by Google

tain covered with rich light-green foliage rises here for at least 1000 feet, and its fall is wept over by traceries of leaves of the softest verdure.

After leaving Dai-ga-hara the main road assumes for some distance the form of an avenue lined with pine-trees, beyond which the boundary between the provinces of Kôshiu and Shinshiu is crossed. The village of Kanazawa, 11 miles further, lies on a fine plateau darkened by pine-woods, from which rises the slope of Yatsu-gataké. The excellence of the road had attracted my attention, especially since entering Yamanashi ken throughout which numbers of substantial bridges seemed to have been recently constructed; but near Kanazawa it was in more than ordinarily good repair being lined with grass borders and trenches. The scenery hence to Shimo-no-suwa demands no special description. It is pleasant, but comparatively tame. Lake Suwa soon comes into sight, a thin blue strip beyond rice-fields, walled in on the farther side by mountains, the more remote of a deep blue and marked by white furrows. The valley in which the lake lies is remarkably fertile, as we could infer from the advanced state of the bright green crops that covered it. Kami-no-suwa, a large substantial village at the southern side of the lake is passed through, then Takashima somewhat higher up, after which the road winds a little above the level of the water to Shimo-no-suwa on the N.N.E. side, when it joins the Nakasendô, just after that highway has overcome the long pass of Wada.

The village of Shimo-no-suwa is famous for its hot springs. It rests on a gentle slope at a short distance from the lake, towards which the principal streets run. The lake itself is about five miles in circumference, and, although shallow, presents, when viewed from the village, a picturesque appearance, on account of the mountains that rise close to its edge. We took a sail upon its surface in a singularly primitive boat, seemingly merely the trunk of a tree hollowed out. Large numbers of dragon flies of immense size were flitting over the surface of the water. It was

Digitized by Google

in the bed of this lake, as before mentioned, that the remains of the founder of Kôfu castle were discovered.

Next morning we commenced to follow the Nakasendô. For some distance the road was level and bordered on the left by rich rice-fields that stretched over to the edge of the lake; but presently we began to ascend, at first gradually, but soon by a steep though good road, the pass of Shiwojiri. We commanded a very fine view of all but the whole extent of the lake, but, on account of the clouds that capped the hills, the cone of Fuji-san was not visible to enhance the scene. The pine-trees at the top were reached in mist, which continued to cling around us as we descended along a winding road lined with shelving pines towards the village of Shiwojiri.

While resting here, we were struck with the appearance of a country girl who, dressed in a garb quite undistinguishable from that of a male farm labourer, passed with a pack-horse. On seeing us, she stood absolutely motionless for several minutes, although my companion was all the time carefully sketching her, and with her look of unsophisticated comeliness, her broad sun-hat and the rest of her peasant costume, presented quite a study for an artist. If her beauty be excepted, she may be taken as a specimen of the mass of the female population of these mountains.

Leaving Shiwojiri, we skirted a plain, 5 or 6 miles in breadth, but stretching on our right to a length much greater. The mist still brooded over the pass behind, but the sun, bursting through, was dissipating white clouds on the dark blue mountains across the plain, and brightening upon the low lands the yellow barley-fields which here formed a pleasing feature in the landscape, as they alternated with the lines of pine-wood or fields of green vegetation. The colours on the encircling hills, also were no less various, the dark indigo of the cloud-topped summits contrasting with different shades of green foliage and patches of brown when the soil was bare. Our road was level and very good; fields of ripe barley bordered it. At a short distance from one part of it we observed

Digitized by Google

signs of lime burning on a considerable scale. We came suddenly upon the village of Séba resting picturesquely on a rich plateau high above the Tambagawa, and at the entrance to the narrow valley luxuriating in wooded heights through which that river here flows. The great majority of the houses seemed to be hotels, and the innumerable badges that hung from the walls of most of them indicated that they derived a large amount of patronage from pilgrims.

The transcendent beauty of our route of the next four days quite baffles description. A winding road, generally from 100 to 150 feet above the pools and rapids of a mountain stream, luxuriantly foliaged hills rising continuously from the river's bed, tier upon tier, until the far upper heights seemed almost to "melt in the silent summer heaven," the bendings of our route revealing similar meanderings in the course of the river as it whirled in eddies round some rocky headland or emerged with smooth green surface from beneath overhanging boughs and filling the horizon with more and still more profusely wooded mountains, rills of ice-cold water from the springs in the upper recesses issuing from the dingles by the road-side and leaping over the grey rocks to join the main river and in union with it keep their compact with the distant sea,—all luxuriating in the untrammelled bounties of nature came upon the mind with such overwhelming beauty that anything like an adequate description is impossible. And then there were the villages at infrequent intervals with their shingle roofs covered Swiss-like with rows of stones, some perched on little plateaus high above the lower recesses of the valley others on the river's brink. At morning, when one side of the deep valley was still in shadow and the dew besprinkled verdure of the other glistening in the sunlight, there would be almost complete silence except the subdued rush of the torrent below, until the sudden filling of the air with the ringing tones of insects would betoken that we were passing a temple grove. No "tiniest bells on the garments of silence" were the notes of these as they pierced the air,

Digitized by Google

some with long high pitched tremulo that seemed to have some connection with the vibrations produced by the summer heat and made one feel hot on hearing it, others with deprecatory diminuendo, others with gradually accelerated windings of some mainspring followed by its speedy collapse. No less like an enchanted land did this region appear at high noon when the dazzled eye looked far up to the subtle flush of life playing around those mysterious pine-depths nearest the sky, gazed on but seldom or never traversed by man. And when the empurpled peaks of the more heavenward heights and the deep shadows on the pool in the valley told that evening was come, the fairy spell seemed not broken, but, if possible, increased. Nor did the scenery lack human interest. Groups of pilgrims with their broad sun-hats, white clothes, and long staves, were continually coming in view, old men and young, old women, maidens, and children, steadily ascending or descending the numerous slopes, or sitting chatting in some wayside rest-house. We would often pass them, for they walked very slowly, but it would only be to overtake them again next morning, for though slow they were steady, and albeit with numerous rests, kept up walking during a much greater portion of the day than we did. There was one conspicuous want among these hills, the want of music. Insects are at best but a sorry substitute for warbling birds, very few of which were to be heard, and the natural music of the cascades and pine-woods only suggested the lack of the human melody that it seemed fitted to inspire. The only effect, likewise, of the short minor snatches occasionally heard, was by suggestion to make the want more apparent.

The four days' journey referred to was through the valleys of the Tambagawa and the Kisogawa. While the whole region is intensely picturesque, one or two parts call for special attention either on account of their outstanding beauty or otherwise. The former valley was entered, as already mentioned, at the village of Séba. For between two and three miles the road follows the right

Digitized by Google

bank of the stream, which, it should be observed, flows in a northerly direction; but after passing the village of Sakurazawa, where we noticed numerous skins of bears, deer, marten, &c., as well as fanciful wooden combs, for sale, it crosses the stream with a romantic bend at the entrance to a lovely branch ravine. Thence it ascends the left bank to Niigawa, a village high above the stream, from which on our arrival at evening we could look back upon our route, getting a glimpse through the narrow glen of the blue mountains beyond the plain, finely shaded by the setting sun. A full moon presently shed its bewitching light over the peaceful scene, casting into mysterious shade the recesses of the pine slope that rose above the cottages of the village. In the midst of this a pretty temple lay embedded, the tolling of the bell of which occasionally broke in upon the monotony of the summer night.

Between four and five miles' walk through the remaining portion of the Tamba valley, among mountains somewhat higher than those between Séba and Niigawa, and at places clad with grass that in the distance looks like rich pasture land, brings the traveller to the pass of Narai. The road ascending it is steep but excellent. Behind it can be seen the valley of the Tamba, as far as Niigawa, when a bend shuts out the rest from view; on the left immediately below is a gorge luxuriating in leaves, the torrent beneath being only occasionally seen through shelving greenery. Just after commencing to descend, we observed, a few yards on the right of the road, with which it was connected, a small hill crowned with numbers of stone images, before which some passing pilgrims were droning their prayers. Far below this lay the stone-covered roofs of Yabuhara in a valley green with rice-flats stretching both right and left, through which wound the Kisogawa in a southerly direction, thus showing that we had crossed a water-shed. After we had descended to Yabuhara (every house in which by the way seemed devoted to the manufacture of wooden combs of all varieties of form,—an industry originated in this village) our

Digitized by Google

route lay along the left bank of this river, at first through a narrow wooded defile, and then far above the stream, amid lofty mountains even more magnificent than those which overlook the Tamba.

In the very heart of this region is the castle-town of Fukushima, situated on both sides of the river at a narrow point in the valley. The main street lined with numerous shops lies on the left bank. Two bridges connect this portion of the town with that which borders the steep wooded declivity opposite and which contains two extensive temples and the ruins of the castle, which in its glory must, from its situation, have presented a singularly romantic appearance. It is from this town that the ascent of Mitaké or Ontaké, the second highest mountain in Japan, is usually made.

The magnificence of the scenery approaches its crowning point when Agematsu is reached. Travellers desiring to ascend Koma-ga-také generally diverge here. A little beyond the village there is a spot from which perhaps the most luxuriant scene in this region is obtained. This is at Urashima Temple, perched above the rocky bed of the river somewhat to the right of the main road. Immediately below the water rushes in green and white foam round white boulders and between precipitous wooded crags. A very picturesque feature in the view is formed by a small shrine dedicated to Benten Sama, embedded in the thick foliage of a little island.

Eight miles beyond Agematsu at another angle of the river but in a more open part of the valley and nearer the level of the channel lies Suwara. It calls for mention on account of the industry which it seemed to monopolize, viz. the sale of preserved flowers laid out in boxes in patterns and of pictures drawn on their wood-shavings.

Between Suwara and Nojiri, the road leaves the course of the Kisogawa, only, however, to return to it at the latter place. On the way thence to Midono, a most imposing hill caught my attention. It was covered exclusively with tall conical cryptomerias, of wonderful symmetry and arranged with almost perfect regularity, so

Digitized by Google

that the hill itself seemed a multiple of each of the trees that covered it. The shape of these, their dark colour, and the depths of truly stygian gloom from which their peaked forms issued, combined to give the whole quite a funereal aspect.

It remains but to leave this region by referring to the view obtained of a large part of it from the pass of Magomé, which lies at the head of a branch valley by which the highway diverges from the course of the Kisogawa. This on the morning on which we witnessed it was grand in the extreme. But a glimpse of the river at one of its angles was visible; clouds were brooding over the dark mountain-tops, while the slopes were brightened by snatches of sunlight, that only served to throw into greater gloom the wooded depths beneath. The whole formed a fit subject for the illustration of some of the grandest passages of Dante or Milton.

In front now lay the province of Mino, an extensive region of low hills, somewhat barren-looking on account of their numerous bare sand coloured spots.

There is no need to dwell upon the pleasantly undulating but tame country through which we passed to Oï, two and a half miles beyond which town we diverged from the Nakasendô to the left along a road leading to Nagoya and the province of Isé. The route we had chosen to reach that city seemed but little frequented; we might have continued by the Nakasendô to Fushimi, a town but a few miles from Nagoya, and then diverged. The district threaded by the road between Oï and Nagoya consists of a succession of low hills, rocky and somewhat barren. At Takayama there is more cultivation; it lies in a rice-sown valley watered by the Horikawa. This, however, is not extensive; presently barren hills are traversed, from which a wide rearward view is commanded of grass and sand undulations varied with tilled valleys. Then appears in front a white river-bed and on the left of it a slope with the town of Tajimi near its base and higher up the smoke of extensive clay-burning works; for the whole of this region is famous for its porcelain clay. A

Digitized by Google

short distance along the river's bank is the town of Ikéda; then follows a narrow defile with dense underwood, the summit of which is on the boundary line between Gifu and Aichi *Ken*. Just beyond this pass Utsutsu nestles among wooded hills. Thence we passed through a fertile valley and across a dry white river-bed, thereafter through a district at first somewhat bare of trees, but covered with rich fields of millet and rice. On the left stretched a series of sandy downs, culminating in a hill on the horizon of 1,000 or 1,500 feet; in front lay an extensive plain dotted with dark trees and bounded in the distance by a high range of blue mountains. As we gradually descended into this plain, we found the country richer; it seemed to abound at this season in water-melons, which were visible everywhere. A few miles further of fertile lowlands, and a high castle-tower appeared on the right. Two rivers, the Katsugawa and the Yamadogawa, both flowing between raised banks lined with graceful pines, were crossed, and soon after we were in the long main street of the populous city of Nagoya. The hotel to which we were taken was situated opposite the great temple of Nishi Honguwanji, the drum-tower and pines at the gate of which stood picturesquely in the light of a full moon, as we arrived. Next morning, however, we had reason to object to the nearness of this tower, for we were awakened at 5 o'clock by the beating of the drum and the bustling noise of crowds of pilgrims entering the sacred inclosure.

The whole length of the city of Nagoya is traversed by a long main street, running north and south. This is lined with substantial houses and handsome shops, and is said to continue without a break for a distance of ten miles, all of which, however, is not comprised within the limits of the city.

At the northern extremity of this street stands the castle of Nagoya, occupying with its grounds almost one fourth of the whole area covered by the city. It was built in the year 1610 A.D. for Yoshinawo, the first prince of the Tokugawa house in Owari, and the seventh son of Iyeyasu. For some two centuries before that date there

Digitized by Google

had been a castle of Owari, situated at Kiyosu, a few miles west of Nagoya. This was founded by a *daimiô* named Shiba Takatsune, a near relative of the Shôgun Ashikaga, and remained in the possession of his descendants until the end of the 16th century, when it was seized by Ota Nobunaga, and made by that famous warrior the centre from which to keep in check the neighbouring provinces. Some years afterwards, Tokugawa Iyeyasu, having survived all his rivals, recognized that his authority would be more secure if Owari, lying as it did at the junction of the two great highways between Kiyôto and Yedo, were defended by a strong castle. He would thus have more command over the western *daimiôs*, some of whom had not yet acknowledged his sway. The castle at Kiyosu was found quite insufficient on account both of its limited size and of the shallowness of its moats ; so he resolved to build a new and more formidable one, and fixed upon the present site at Nagoya as the most advantageous for his purpose. Several *daimiôs*, the principal of whom were Fukushima Masanori, Prince of Aki, Katô Kiyomasa, Prince of Higo, and Kuroda Nagamasa, Prince of Chikuzen, were, after some threatening, prevailed upon to undertake the task. The materials of the old fortress at Kiyosu helped to compose the new stronghold, and it is said that 200,000 men were employed, who finished the work of erection in a few weeks. However, the castle of Nagoya was never completely fortified, as may be inferred at the present time from the shallowness of its moats and the fact that, although its inner parts are sufficiently strong, there is a lack of outer defences. As above mentioned, this event took place in 1610 ; and a few years thereafter Yoshinawo made the new castle his headquarters.

Although less amply protected than some of the other strongholds of Japan, Nagoya Castle is remarkable for its beauty. Its main tower, conspicuous for many miles over the plain, is at its highest point about 240 feet above the moat, and until a few years ago, the extremities of the ridge of its roof were ornamented with two immense

Digitized by Google

golden fish called *shachi*, one of which is now to be seen in the Tôkiyô exhibition. Just within the castle grounds is a well calling for attention on account of the fact that its bottom is said to be covered with a sheet of gold.

Many of the temples of Nagoya deserve a visit. The number of shrines is considerable, and I was struck with the numerous priests to be seen in the streets and likewise the large proportion of shops devoted to the sale of altar gear. The majority of the temples are large and of plain exterior, their massive beams intricately carved, but uncoloured. The most imposing of them, Nishi Honguwanji near the south end, may be compared with some of the finest Buddhist temples in Kiyôto ; it is remarkable for its unusual height, being of two stories.

Among the proofs of recent progress are to be noted the Normal School and the Hospital and Medical School. The former is a long low building with extensive wings and adorned with a low tower, from the top of which we obtained a fine view of the plain and the mountains that environ it, Tado-yama and Ibuki-yama rising to the west. We learned that about 200 students were in regular attendance, and the accommodation for them seemed ample and well arranged. Aichi *Ken*, we were also informed, contained 800 schools. The neatness of the Hospital and the excellence of its arrangements more than favourably impressed us. The wards were of only one storey, and narrow and airy ; and between the different wings, which were connected by covered passages, tasteful little flower gardens were laid out. A Medical School with about twenty-five students is attached. The city also contains a Bank and several elementary schools.

The industry for which Nagoya and the whole of the province of Owari is celebrated, is the manufacture of porcelain ware. The neighbouring village of Séto gives its name to the ware, *sétomono*, the production of which brought it into notice. Among its present sights are some massive *toro* made of solid porcelain. In Nagoya there are several establishments where enamelling is

Digitized by Google

carried on. We visited one of them and witnessed the interesting process in its different stages, the forming of the design with thin metal ribbon, the filling of the interstices with enamels of various colours, the numerous bakings, the final polishing, etc.

The long main street of Nagoya stretches to the seaport of Miya on the Tôkaidô. Hence a junk sails to Kuwana when the weather is fine; but a fall of rain prevented its starting on the day of our setting forth for the latter town, and we were obliged to travel across the flat plain. Every available spot of land was laid out in rice-flats; beyond these, in front, mountains loomed indistinctly through the hazy atmosphere. We crossed no fewer than five rivers, branches of the delta of the Kisogawa, all broad and deep, and flowing quietly between banks overgrown with furze or lined with evergreens. At length we came to Mayegasu on one of these streams, where it was necessary to take a boat. Between banks of copse-wood we descended several branches of the delta, until we reached the sea, when the castle walls and houses of Kuwana came in sight. This town is celebrated for a peculiar kind of earthenware called *banko*, extremely thin and fragile and very much valued. We visited one of the manufactories of it, where we observed that most of the manipulation of the soft clay was performed with the fingers alone.

There is no need to dwell upon the comparatively well-known Tôkaidô route from Kuwana to Kiyôto. The coast-line is followed more or less to Shiku, seven and a half miles beyond Yokkaichi, whence the mountains are gradually approached. Beyond the castle-town of Kameyama the lower spurs begin to encircle the road, and when Séki, remarkable when we visited it for the number of its *matsuri* cars, is passed, and Saka-no-shita reached, the traveller is in a region of picturesque wooded heights. Just above the last mentioned town is the romantic winding pass of Sudzuka, which being overcome, gentle undulations lead to Tsuchiyama and Minakuchi. Then follow in succession, a plain with a very sandy soil and bordered

Digitized by Google

by mountains, revealing many bare patches of sand and rock, a fertile region with tea plantations, glimpses of the southern stretches of Lake Biwa and high hills beyond, the handsome bridge spanning the Ujikawa at its efflu-ence from the lake, the long town of Otsu on the southern shore of the lake, that stretches beyond headlands towards the distant mist-capped mountains, a sudden turn to the left through a defile along a road of excellent qua-lity, a sight of a pagoda beyond the vista of the road, a plain with numerous buildings opening out, houses on both sides; and the traveller finds that he has reached Kiyôto.

To the writer of another paper it must be left to give a full description of this, the most attractive of all the cities of Japan. Here it will be sufficient to refer generally to its air of elegant repose, as it lies amidst its environment of hills. Its main length is from north to south, thus corresponding with the valley, hemmed in on all sides except the south, in which it is situated. On the east its houses run up the glades and partly ascend the slopes of the wooded range of which Maru-yama is a prominent feature. It is from among the groves of these hills that the pagodas and roofs of some of the most celebrated tem-ples picturesquely issue, Kiyomidzu, Nishi Ô-tani, San-jiu-san-gen-dô, Gion, Chiôuin, Kurodani, and others. Broad stately avenues lead to several of them, notably Chiôuin, which is considered the principal Buddhist temple in the empire, and on which alone a lengthy paper might be written. The appearance of the wooded spurs between and on which these sacred buildings lie, is picturesque in the extreme, the foliage for the most part dense and sombre, but exquisitely varied at points by the brilliant scarlet blossoms of the *saru-suberi* or other flowering trees in the gardens connec-ted with the sacred enclosures. The Japanese sometimes speak of the *saru-suberi* or *hiyaku-jikkô* as the laughing tree, and verily it seems to laugh like a gleesome maiden among these sedate old groves. From Kiyomidzu a beau-tiful panoramic view of the city is obtained, in which its

Digitized by Google

general form can be taken in at a glance. It is observed that the western and northern sides are separated from the mountains by some miles of level country. The white bed of the Kamogawa is seen to cut the city into two unequal portions, a western and an eastern, the former much the more extensive. The regularity of the lines of houses, especially beyond the river, shows that the streets run almost invariably at right angles to one another. In the west the white line of the walls of the Nijô, or Shôgun's Castle, break the uniformity of brown dotted with white spots; more to the north the high roofs of the Gosho, or Emperor's Palace, emerge from amid dark foliage. The pagoda of Tôji in the south-west corner, and near it the roofs of the Honguwanji temples, the hexagonal shrine of Rokkakudô, and several other sacred edifices, rise conspicuously from the array of low buildings, and the whole scene is closed in by a wall of high hills. The streets, when more narrowly observed, are found to be as neat as they are regular, and seem in many respects but the expression in wood and plaster of the tidy, complacent, pleasure-l ving disposition of the inhabitants. Indeed, this city has a peculiar and irresistible charm, whether we consider its romantic situation, its venerable associations, or the air of elegance and contentment that characterizes its people.

Much might be said regarding the pleasure resorts of Kiyôto, beginning with those of the aristocracy,—such as Kin-kaku-ji, to the north-west, built by Yoshimitsu, 3rd Shôgun of the Ashikaga line; Gin-kaku-ji, to the north-east, built by Yoshimasa, the 8th of the same dynasty; Sen-gaku-ji, situated like the Yeizan and of old frequented by the emperors,—and afterwards noticing such favourite haunts of the populace as the temple-grounds of Kamo, Megane-bashi with its lotuses near the temple of Nishi Ô-tani, and the matted platforms in the channel of the river above Sanjô Bashi, lit up at night with the variously coloured lanterns of hundreds of pleasure-seekers. I shall confine myself, however, to a few remarks upon the ceremonies connected with *cha-no-yu*, special

Digitized by Google

chambers for the observance of which were built at Kin-kaku-ji by the Shôguns above mentioned, and are still to be seen in good preservation.

When Rikiu, the most celebrated teacher of the art of tea-making, was asked by a pupil to state the objects of his art, he replied, "To make tea to suit the palate, to arrange charcoal to boil water, and to construct a house so as to ensure coolness in summer and warmth in winter." On hearing this, the pupil was disappointed and said that if that were all he had no need to learn; whereupon the teacher rejoined, "Very well, I wish you to become my instructor." "Right, sir," cried a priest who sat near; "a little child understands all you have said, but the most experienced man could not perfectly carry it out in practice." And the priest spoke the truth, for apart altogether from the third object, the construction of a suitable house, *cha-no-yu* meetings were surrounded by the Japanese with so much ceremony, much of it, as it may seem to us, of a very arbitrary character, that a special education was required by any one who desired to take a prominent part in them. They were originally established for the promotion of peaceable relations at a time when society was in much need of these, and it was on this account that they received so much countenance from the less warlike of the Shôguns. A great many of the details would be tedious if related, but it is hoped that the following short outline of a custom long prevalent in the country may not be without interest.

First as to the kind of meeting-place. Of this the chamber at Kin-kaku-ji may be taken as a specimen. It is in an inconspicuous part of the building, and looks out upon a corner of the grounds that is secluded, but tastefully laid out as a miniature landscape. The floor contains but three mats; in the centre is a square fire-place with a bamboo hook suspended above it. The walls are absolutely bare, with the exception of a small *kakemono* in a recess inscribed with some Chinese characters. An ante-chamber of two mats adjoins the room proper, and between the latter and the outer door there stands a stone

Digitized by Google

cooking-place. Everything is of the simplest and plainest description, as was required by the rules of the institution. The ware used was chosen partly for its roughness and partly for its peculiarity of shape. It was called *raku-yaki*, after its inventor, to whose family the privilege of making it has ever since been confined; indeed, when in Kiyôto, I called upon his descendant in the eleventh generation, who, in his factory at Kiyomidzu, maintains the monopoly to this day. The following was the general order of procedure at a *cha-no-yu* gathering: In front of the house a bench was provided, on which the guests waited until the sounding of a bell by the host within bade them enter. The party were exclusively of the male sex and usually five in number, but there was no definite rule on the latter point. No servants were present, the host himself performing the duties, both of cooking and of waiting. For the successful accomplishment of each of these a proper education was required. The tea leaves were ground to a fine powder, and a definite proportion had to be observed between the quantities of tea and hot water. When the latter had been poured upon the powdered tea, the mixture was agitated with a peculiar kind of brush made of bamboo. The infusion being complete, a cup was filled and passed round the company, each guest taking a sip. The host himself did not drink, and it was considered the height of impoliteness for any one to drain the cup before it had made the circuit of the party. Certain games were associated with *cha-no-yu*, of which the following may be taken as a specimen. The host laid before his guests a number of wooden tablets, each inscribed with the name of some particular kind of tea. He then out of their sight made a decoction of one of these kinds, and the man who afterwards determined the name of this from its flavour, was considered the king of the company.

The above is but a meagre outline of this custom, every movement in the ceremonies of which was done by rule, and in which not a vessel was used that had not its material and shape defined. Among many of the other

Digitized by Google

institutions of the country it has gone out of favour, and is now regarded as tedious and trifling; but it no doubt did good in its day in helping to bind men together in social union, and fostering that sense of the sacredness of hospitality which, as in the Highlands of Scotland, led a man to treat with the utmost consideration even his deadliest enemy, so long as he remained his guest.

Let me leave Kiyôto by shortly describing two of the most interesting scenes in its neighbourhood, the rapids of the Katsura-gawa on the western side of the plain, and Hiyei-zan with its extensive panoramic view, on the north-east.

Out of the ancient city near the pagoda of Tôji at the south-western corner, and amid the rice-fields and clumps of thicket, until these become more frequent and those disappear, as we wind among the bamboo groves of a mountain pass. We, all three of us, have brought *jin-riki-sha*, but the road becomes too steep for travelling in them, and we walk to the summit. Thence the slope is more gradual. We pass through a mountain village and into the province of Tamba, and soon the country opens out and takes the form of a rich green plain closely environed by hills and with the high towers of the castle of Kameyama rising from the midst of its vegetation. We do not go as far as the castle, but diverge to the right along a path bordered by fertile fields of grain. A few hundred yards of this, and we are on the bank of a swiftly flowing but shallow river, that a short distance to the right entirely disappears among the wooded defiles of the range we have just crossed. This, we are told, is the Katsura-gawa, and among the defiles of these hills are the rapids that have induced us to make this excursion. After some delay in fixing terms, for the boatmen seem to us to demand an exorbitant charge—but on this point we afterwards changed our minds, as may be inferred by the sequel—we are on board a boat 40 feet long, between 4½ and 5 feet broad, and with a flat and very pliant bottom,—11 persons in all, for in addition to ourselves and the coolies

Digitized by Google

with their three *jin-riki-sha*, there are five boatmen. Of the latter one acted as steersman, while the other four directed the boat's course with bamboo poles. A few pushes into the main current and we sped like a dart into the heart of the mountains. Reaching a calm green pool, we have breathing time to look around. Wooded heights of from 1000 to 2000 feet rise sheer on both sides and shut in the view both behind and before. Huge boulders of rock covered with grass and copsewood or wooded with pines, border the stream at the base of these. At a sudden bend of the river in advance the water looked disturbed; a warning shout and we are careering down another rapid. The stream is shallow, and the pliant floor of our boat is continually bending as it scrapes the bottom. But, what is worse than this, sharp stones of all sizes project above the surface in all directions, often barely leaving space enough for the boat to pass. Sometimes we are borne resistlessly by the current right towards one of them, and the destruction of the boat seems imminent; but the man at the bow with a dexterous stroke just at the right moment, sends us spinning away from it. His work, however, is not yet done, for the impetus given to avoid one rock seems likely to send us on to another on the opposite side, and again it requires a timely stroke to save us. Quietly sailing on the next tranquil pool, we feel the wild solitariness of the scene around, —hills rising precipitously on every side, no road or sign of man, if we except one lonely fisherman, and nothing suggestive of animal life except the bees' nests that hang from the crags and a few insects flitting on the water. But a third rapid has to be descended, and this time we fare less luckily, for the bottom of the boat is split open by a jagged rock, and we are beginning to sink, when the speedy application of some iron clasps keeps us afloat. Thus we continue for an hour and a half, rapids and pools alternately, until the river becomes calmer and broader, and there appears in sight a long wooden bridge spanning the stream with the plain open beyond it, and there rise on our right the dark groves of Arashi-yama often

Digitized by Google

celebrated in song by the poets of Japan. Seven miles' journey across the plain brings us back to Kiyôto.

Some six miles to the north-east of Kiyôto, and between the provinces of Yamashiro and Ômi, rises the sacred mountain Hiyei-zan, the most prominent of the eminences that border the plain in which the city lies. With this mountain are connected many important incidents in the history of Japan. Ancient annals record that the first temple erected on it was founded by Shôtoku, the son of the emperor Yômei, who reigned from 580 to 588 A.D. In 788 A.D., a priest named Saishô, by command of Kuwammu, the first Emperor who fixed his seat at Kiyôto, built another temple, to which, along with other shrines that came to surround it, the name of Yenriyakuji was given. This Saishô was a man of much learning and in high favour at the Emperor's court. He was sent on a mission to China, in order that he might learn the doctrines of a famous Buddhist sect in that country—afterwards called Tendai, from the name of the temple where it originated—and introduce them into Japan. This he did, bringing at the same time a thousand sacred books, and the first tea-plants ever seen in the country. Tradition further says that he transported from Gotai-zan in China the earth on which to build the first temple of the Tendai sect in Japan. The new opinions prospered, and the temples on Hiyei-zan comprehended under the name Yenriyakuji increased to a large number, and became remarkable for their magnificence and the wealth of their revenues. In the midst of their prosperity, the priests forgot the peaceable character of their calling, and took an active part in the numerous feuds that distracted the country. Their temples became castles, strong both in themselves and from their position and on account of their size capable of containing sufficient provisions to outlast a long siege. Such was the power of the warlike priests, that they defied the Emperor himself to subdue them. In the war, however, between the Emperor Godaijô (1319 A.D.) and the rebel Ashikaga, they took the side of the former and afforded him refuge,

Digitized by Google

when Kiyôto was beseiged. Their despotism over the neighbouring provinces at length became so unbearable, that Ota Nobunaga resolved to take summary vengeance upon them, and this he did one dark night, burning the temples to ashes and killing or taking captive the priests. In the time of the Shôgun Iyemitsu, however, the former splendour of the monasteries of Hiyei-zan was restored and the spiritual power of the Tendai sect revived. Notwithstanding an attempt on part of the Shôgun in 1627 to dispossess the priests of Yenriyakuji of their preëminence by transferring his favour to the new shrines at Uyeno, Yedo, they continued to flourish, until the revolution of 1868 came, and they fell into the background among other characteristic features of old Japan.

So much for the history of the monasteries on Hiyei-zan. I shall now shortly describe an ascent that I made of it.

It was a brilliant summer morning as, after an hour's ride from Kiyôto, we left our *jin-riki-sha* at its base, and after ascending a pretty little valley for about half a mile and crossing a bridge, commenced to climb by a steep zig-zag path. As we rose, more and more hills revealed themselves, one of which, immediately opposite, being largely covered with a purple flower, reminded me more of a Scottish hill than anything I had seen in Japan, and a portion of the plain and city of Kiyôto, the latter a mass of brown sprinkled with white spots, came in sight. But we presently reached the summit of this grassy shoulder, and descended into a leafy ravine, beyond which a dark-foliaged hill rose, with a few high roofs peering out from amid its recesses. These we afterwards found belonged to some of the monastic buildings, for the road soon ascended in the direction of the hill referred to, amid groves of magnificent cryptomerias. The sacred edifices which we first reached were fast falling into ruins, but a little further on we came to a temple with a handsome roof and in good preservation. This we imagined to be also deserted, until we heard from its interior the sound of a bell, and approaching nearer could hear low mutter-

Digitized by Google

ing and see that a dim light was burning before the altar. At this point the road made a sudden turn to the right and continued amid imposing cryptomerias past several shrines, some in a state of good repair. One had a remarkably well-kept court-yard, in which an elegant bronze fountain was playing. The roofs of numerous other temples could be seen among the trees, as, at a point where a large bell hung above the bank of the road, we diverged to the right by the path leading to the summit. We soon left the cover of the trees and followed a bridle-path through short bamboo grass, the round grassy summit appearing above us against an exquisitely blue sky. Thither a short but steep climb brought us, and we stood in command of a panoramic view of the sublimest description. On the north the whole extent of Lake Biwa, "with promontory, creek, and bay," lay calmly stretched for fifty miles to a dark mountain barrier. In the foreground its waters were overlooked by hills of the most luxuriant dark green, and its blue sheet was broken at intervals by white sails. To the east of these hills a shoulder of the mountain obscured a small portion of the lake, which, when it again appeared, was much narrower, and margined on the further side by a flat fertile shore, behind which the sand-downs traversed by the Tôkaidô rolled away to the hills on the horizon. Appearing right below us at the southern extremity of the lake were the thickly clustering houses of Otsu; a little steamer was entering the harbour. Then to the south followed wrinkled hills until the plain of Kiyôto came into view, with the city lying at full length, an oblong mass of brown varied with white in a green setting. The two tributaries of the Kamogawa could be followed until they met at the city's northern extremity and then united into one stream, the yellow channel of which formed two well-marked but unequal divisions of the area of houses. Numerous white spots indicated those buildings whose walls were plastered, one, long and horizontal, being evidently the Shôgun's castle; and a space of thick wooding near the northern boundary

Digitized by Google

marked what was at one time deemed the most sacred spot in all Japan, the secluded seat of the Son of Heaven. Cloud-shadows were slowly creeping over the plain, which grew less and less distinct until it almost merged with the faint surface of the distant sea. To the west, hills beyond hills rolled away to the horizon like an ocean of billows. The summit of Hiyei-zan is marked with a little granite dome of from three to four feet high and containing a stone image. The ascent of this mountain from the point where we left our *jin-riki-sha* took us about two hours, and the descent rather more than one hour. The height of the summit above the plain is 2,700 feet, and the latter being 300 feet above sea-level, the total height of the mountain is 3,000 feet.

These notes may fitly close with this panorama of the romantic region in which for so many centuries lay secluded from the world this venerable city of Japan, destined, let us hope, to be encircled in the minds of men with an even brighter halo than that which, in the days of the nation's childhood, the presence of the Son of Heaven threw around her. May the pearl become still worthier of its setting, for fair as any dream of elfinland are these sunny hills and shadowy glades.

ITINERARY.

	Ri.	*Cho.*
KÔSHIUKAIDÔ :		
Yedo	0	0
Fuchu	8	0
Hino	2	0
Hachioji	2	0
Komakino	2	0
Obara	3	0
Uyenohara	3	0
Saruhashi	5	0
Kuronoda	4	0
Koma-ga-yeki	2	5
Katsunuma	2	0
Kofu	4	0
Nirazaki	3	18
Dai-ga-hara	4	7

Digitized by Google

Sutaki	2	0
Kanazawa	4	8
Kami-no-suwa	3	0
Shimo-no-suwa	1	0

NAKASENDÔ :

Shiwojiri	2	30
Séba	1	30
Motoyama	0	30
Niigawa	2	0
Narai	1	30
Yabuhara	2	0
Miya-no-koshi	1	30
Fukushima	2	0
Agematsu	2	18
Suwara	3	9
Nojiri	2	0
Midono	2	18
Tsumagome	1	18
Magome	2	0
Ochiai	1	5
Nakatsugawa	1	0
Oï	3	0

PILGRIMS' ROAD TO ISE :

Kamado	4	0
Toki	1	0
Takayama	2	21
Utsutsu	4	14
Sakashita	1	18
Katsugawa	2	18
Nagoya	2	18

TÔKAIDÔ :

Kuwana	7	0
Yokkaichi	3	0
Shiku	3	0
Saka-no-shita	6	0
Tsuchiyama	3	0
Minakuchi	2	0
Kusatsu	6	0
Otsu	4	0
Kiyôto	3	0

Digitized by Google

Digitized by Google

ASIATIC SOCIETY OF JAPAN.

The opening meeting of the session was held in the Grand Hotel, Yokohama, on the evening of Saturday, the 13th October, 1877, when the chair was taken by Mr. J. J. Keswick, Vice-President.

The Chairman having opened the proceedings and the minutes of the annual meeting of the 27th June, which are published in vol. v. of the Transactions, having been taken as read, the meeting elected His Excellency Monsieur De Struve, Mr. R. H. Smith, Mr. H. S. Wilkinson and Mr. W.G. Dixon as a Committee of ordinary members to confer with the Council as to the desirability of amending the rules by charging an entrance fee to future members.

The Recording Secretary announced that at the Council Meeting held on the 6th idem Mr. Henry Liddell of Niigata had been elected a member of the Society.

The Chairman then introduced to the meeting, Professor Morse of the Tôkiô Dai Gaku, recently Vice-President of the American Association for the Advancement of Science, who delivered a lecture on the Early Traces of Man in Japan. After rapidly describing the formation and the discovery of the best known shell-heaps of Europe and America, the lecturer related his own discovery of the shell-heap near Omori, and exhibited a large number of specimens that he had extracted from it.

The Chairman closed the proceedings by thanking Professor Morse in the name of the Society for his exceedingly interesting and instructive lecture, and expressed a hope that the meetings of the Society throughout the coming session might be favoured by as large an audience as were assembled on the present occasion.

Digitized by Google

Digitized by Google

NOTES OF A VISIT TO HACHIJÔ IN 1878.

BY

F. V. DICKINS AND ERNEST SATOW.

Read before the Asiatic Society of Japan, on the 22nd June, 1878.

—o—

The island of Hachijô, or Fatsizio, as the name is spelt in the English Admiralty chart No. 996, is the last but one of the chain which extends south of the promontory of Idzu in almost a straight line, beginning with the still active volcano Vries or Barneveld's island, called Idzu-no-Ô-shima by the Japanese. In Siebold's Historical Review of the Discoveries of Europeans in the Japanese Seas (Nippon, Bd. I, Abt. 1. page 60) the name of Tasman's Islands is proposed for this chain in honour of the Dutch navigator who discovered them on the 1st November 1639, in returning from a voyage of research after the Gold and Silver Islands, which were at that time believed to exist somewhere to the east of Japan in the North Pacific Ocean. Four years later, on the 19th May 1643, Martin Gerritson Vries, commander of the Dutch transport Castricum, being driven by wind and current out of his course, found himself compelled to anchor off the N.W. point of an island, to which he gave the name of Ongeluckich eylant (Unlucky Island). The description given in his journal agrees with a sketch made by Tasman and his fellow-navigator Luast, and has enabled

Digitized by Google

Siebold to identify the island with the Japanese Hachijô.* The honour of having discovered the island belongs therefore to Tasman, but as neither his journal nor that of Vries were published until about twenty years back, and it does not appear to have been visited by any other European vessels until the present century, it is no wonder that Kaempfer, who depended for his information upon Japanese interpreters who spoke Dutch more or less imperfectly, should not have been able to give a more correct account than the following:—

"*Fatsisio*, I just now had occasion to mention, or *Fatsisio Gasima*, which is as much as to say, the *Eighty Fathom Island*, is the most remote island the Japanese have in possession southward. It lies under the same meridian with *Yedo*, and is reckoned to be about 80 Japanese water-leagues distant from the Continent of *Japan*, being the furthermost of a long row of small islands, almost contiguous to each other. It is the chief island, where the great men of the Emperor's Court, when out of favour, are usually confined, pursuant to a very ancient custom, and kept prisoners on a rocky coast, from the extraordinary height of which the whole island hath borrow'd its name. As long as they continue on this island, they must work for their livelyhood. Their chief amusement is weaving, and some of the silk stuffs wrought by them, as they are generally men of ingenuity and good understanding, are so inimitably fine, that the Emperor had forbid under severe penalties to export or sell them to foreigners. This island, besides it being wash'd by a rough tempestuous sea, is so well guarded by nature itself, that when there is some provision of the common necessaries of life, or some new prisoners to be brought in, or the guard to be relieved, the whole boat, with all the lading, must be drawn up, and again let down by a crane, the whole coasts being so steep and rocky, as

* For further details see Reis naar de Eilanden ten N. en O. van Japan door Mrt. Gerr. Vries, Amsterdam, 1858 p. 63, and Siebold's Tœlichigen p. 270 and onwards of the same volume.

Digitized by Google

to admit of no other access." (Kaempfer p. 69; Edn. of London 1727.)

In this notice of Hachijô, which reads almost like a passage from the Arabian nights, the only correct statement is that which relates to the situation of the island. No one was ever banished to it before 1603, scarcely a century earlier than Kaempfer's stay in Japan, and therefore it cannot well be said that confining any class of persons there was a very ancient practice in his day. Of great men belonging to the court of the Mikado (*Kuge*), none was ever exiled to Hachijô, though Ikida Hideiye, a supporter of Hideyori and therefore one of Iyeyasu's foes, was sent there in 1603 when his retreat in Satsuma was discovered. There is no reason to suppose that he or his descendants were weavers. On the contrary, the manufacture of silken cloth in the island dates from the fifteenth century, and it was the means of furnishing the annual tribute of the farmers, which was paid in the products of the loom, instead of in rice, money or any of the other various kinds of payment in vogue on the mainland. The statement that the coast is so steep and rocky that the only way of gaining access is by being drawn up by a crane, boat and all, is an absurd exaggeration. It is true that there are no commodious, almost landlocked, harbours in the island, but there are several small coves and beaches where a landing can be easily effected in calm weather, and it is very doubtful whether landing is impossible at any time, except perhaps during the most violent storms.

The first Europeans who are known to have landed on Hachijô were some Englishmen from a man-of-war which anchored in Observation Bay at the south end, about forty years back. It is conjectured that this ship was H. M. S. *Raleigh*. They were armed with muskets and bayonets. Most of the inhabitants fled, driving their cattle into the mountains, while a few who remained out of curiosity, endeavoured to convey to their unwelcome visitors an impressive idea of the poverty of the island, by plucking raw herbs and pretending to eat them with

Digitized by Google

avidity. This stratagem had the desired effect, and the strangers re-embarked on the same day. In the year 1871, on the 17th day of the 8th moon (probably in the latter part of September) a vessel under the Japanese flag appeared close to the shore in Observation Bay, from which landed several persons supposed to be English, who took observations. The captain wore a long red beard, and was assisted out of his boat by two men, one on each side of the gangboard. These foreigners were accompanied by a Japanese named Araki Saisaburô, and saluted the people with the words *o hayô*. They left the same day. These particulars were furnished to us by an old inhabitant of Suyeyoshi. This vessel we have ascertained by searching the records of H. M. Legation, was H. M. S. *Actæon*, commanded by Captain Ward, and Araki Saisaburô was one of five officials lent by the Japanese Government. On neither of these occasions was anything like a thorough exploration of the island attempted; the surveying parties did not penetrate into the interior, ascend the mountains, or in fact go beyond the immediate neighbourhood of Observation Bay, and they had therefore little opportunity of obtaining information which would have served to correct the account given by Kæmpfer. A paper was read before this Society during its last session, by Mr. Longford, entitled "a Japanese account of the island of Hachijô," but it has not yet been published in the Society's transactions.* We are not acquainted with any other descriptions of Hachijô in European languages, and it is therefore possible that the following account, drawn up chiefly from notes made by us during a stay on the island of eight days in the beginning of March last, may be of interest to the Society.

According to the Admiralty chart above mentioned, the island lies between N. Lat. 33°, 2′ and 33°, 9′, with its longer axis running almost N.W. by S.E. A few miles (the inhabitants say five) west of the N.W. end, rises out of the sea a small island named Koshima, wrongly marked Kodsine in the chart, which like Awo-ga-shima, thirty-two or thirty-three miles a point or two west of

* It is now published as an appendix to this paper.

Digitized by Google

south from Hachijô, is a dependency of the main island of this small group. The nearest land to the north is Mikura island, separated from Hachijô by a stretch of sea about forty miles in width, through which runs the much dreaded Kurose-gawa or Japan current (also called *Kuroshiwo*) in an easterly direction.

The length of Hachijô between its extreme points is ten or twelve miles, its greatest width probably not more than three or four. At the N. W. end rises the volcanic peak to which the name of Fuji has been given by the inhabitants, after the great mountain on the mainland. The height marked on the Admiralty chart is 2,840 feet, which is probably not far from exact. Single observations made by us with two aneroids gave respectively the results 2,825 and 2,834, but without taking into account the difference of temperature at the base and the summit, which was only 5 Fahr. (53° and 48°). The massive group of mountains which occupies the southern half of the island, consists of a large amphitheatre of ridges, the highest of which is probably about 2,300 feet; the observations made with our two aneroids give 2,350 and 2,214, when calculated without the correction for temperature, which would be very small (52° and 49° Fahr. at base and summit respectively). A long and lofty spur runs down from this group in an easterly direction, and terminates in a precipitous cliff, over which the coast road from Mitsune to Suyeyoshi passes at an elevation of nearly a thousand feet. It seems evident that the whole island is of volcanic formation, and the shape of the southern group suggests the conjecture that a crater formerly existed on its summit, but the alluvial soil which covers the surface is so thick and so densely overgrown with forest, that the necessary evidence to determine the point is not readily accessible. The ascent can be made from either Mitsune or Nakanogô; the climb from the former village is very steep and difficult, but gives access to the highest point, while the ascent from Nakanogô is the most picturesque.

The northern peak, called Fuji, or Nishi-yama (west

Digitized by Google

mountain), possesses a perfect crater on its summit, apparently about a quarter of a mile in diameter, with an unbroken circuit, for the most part precipitous on the inner side, but accessible from a slight depression on the eastern edge. In the centre of this crater rises a circular plateau, divided on its eastern edge by great rents and chasms, the bottoms of which have long since been filled up by decayed vegetable soil, and much overgrown with ferns and dwarfish trees, chiefly box and Eurya japonica (*sakaki*). The top of the plateau is covered with long grass and thick moss, and is dotted with small pools of water, such as are frequently met with in filled-up craters: in fact there can be little doubt that this plateau is the remains of a secondary cone that has crumbled away and fallen in upon itself. In a little grove, at the end of the right hand branch of the ravine which divides the outer circle from the plateau, are two small Shintô shrines, and behind them yawns a deep gulf of circular form with perpendicular sides, into which it would be impossible to descend safely without the aid of a long rope. This is evidently the last seat of volcanic action on this mountain, but sufficient time has already elapsed since an eruption took place, to allow of the bottom becoming entirely concealed by trees, and for hardy bushes to perch themselves on every projecting point of rock.

On the outside, the mountain is covered with trees and bushes almost to the very summit, chiefly Eurya japonica and a species of alder, probably Alnus maritima, except for a short distance below the top on the eastern side, where the path mounts over loose cinders. The lower slopes are frequented by black cattle belonging in common to the inhabitants of the villages of Mitsune and Okagô, which find pasture there of ferns, coarse grass and the young alder shoots.

Between the volcano and the southern group of mountains lies a plain about three miles in width from sea to sea, gradually rising in the centre to a height of 250 feet, and variously composed of lava, cinders and stiff clay soil,

Digitized by Google

about one half of which is cultivated as paddy field and arable land, the other half being covered with forest. Numerous streams of water flow down the ravines of the southern group, and render this the more fertile portion of the island, for even the cinders are by its help made to yield good crops. In this district lie the two flourishing villages of Ôkagô and Mitsune, the former of which contains the seat of administration for the whole island, each with a population of not much under two thousand. The three remaining villages of Suyeyoshi or Suyeshi, as it is sometimes pronounced by the people (1,000 inhab.), Nakanogô (about 1,500 inhab.) and Kashidate (1,300 inhab.) lie on the eastern and south-western slopes of the southern group, for which the islanders have no other name than O Yama, the MOUNTAIN.

According to the marginal notes on a map entitled "Complete map of the seven islands of Idzu" (伊豆七嶋全圖), the island of Hachijô is 37 miles in circuit, 7½ in width and 18 in length, which is of course impossible. The figures we have already given are much nearer the mark. At that date (1829) the whole number of houses in the island was 968, inhabited by 8658 persons. The total area of cultivated land was 361·55165 *cho*, or about 896 acres, taking the acre as equal to 1210 *tsubo*. The population of Koshima was then 576 in 56 houses, and that of Awoga-shima 188 in 38 houses. In 1729 the population of Hachijô was only 5770, so that it had increased nearly 50 per cent. during the century, and a corresponding increase was noted in the number of houses, which in 1729 was only 629.

Rocky precipices descending sheer into the sea, or beaches formed of huge water-worn boulders which have fallen from the cliffs above, and the contorted ends of lava streams surround the island almost completely, except in two or three places, where a small opening in the rocks gives access to a few yards of black sandy shore. Near the village of Ôkagô is a very singular beach. The basalt cliffs which characterize the southern part of the island

Digitized by Google

are here wanting, a broad stream of lava having descended with a very gentle inclination into the sea. The singularity of the beach consists in the heaped up ridge of huge round stones of which it is formed. The average diameter of these is three feet or more, and the whole has the appearance of an artificial breakwater, painfully constructed to defend the land against the incursions of the Ocean. At first sight it is difficult to account for the origin of this mass of huge shingle. But an examination of the neighbouring cliffs to the southward soon explained the mystery. These were seen to be composed of alternate layers of hard lava and black scoriæ in which were imbedded blocks of lava of all shapes and sizes that had been blown out of some ancient crater together with the tuff and cinders. As the cliffs disintegrated under the continued influence of sea and weather, the fragments fell out of their matrix, and the ceaseless rollers that beat upon the base of the cliffs soon wore down the angular masses into smooth ovaloid stones, which the prevailing set of the waves heaped up upon the adjacent shelving shore somewhat inland of the cliff line. Such fragments, indeed, in all stages of water-wear are to be seen in plenty scattered under the cliffs ; the more water-worn masses, as more susceptible of movement, in advance of the fragments of which the angular edges had not yet been rounded off. The *hamayû*, a stout amaryllidaceous or possibly orchidaceous plant grows abundantly wherever the shingle does not lie too thick upon the disintegrated surface of the lava-stream, mingled with frequent tufts of a splendid Euphorbia which was in full flower at the time of our visit.

One such recess as we have mentioned occurs on the N.E. coast, near the village of Mitsune, and is dignified with the name of Ka Minato (Port Ka). Here we found five small junks drawn up on the beach, which form the ordinary means of communication with the other islands of the chain, whenever the sea and wind, which seems at least not to happen in the winter months, allow of a short voyage being undertaken ; and there were also a few open

Digitized by Google

boats used at the proper season in the bonito fishery. On the opposite side of the island near Ôkagô is another such tiny harbour, known as Yaye no minato, whence boats venture across to Koshima during the summer months. It seems extraordinary that this stretch of water, not more than five miles wide, should be unsafe to cross during half the year, but the constant current, noticed by the navigator Vries, which runs between the two islands, the northerly winds which prevail during the winter, and the rocky nature of both coasts are sufficient reasons for caution on the part of the inhabitants, whose habits are more those of agriculturalists than of seamen. Further down the west coast of Hachijô at Nakanogô, where we landed, is a little cove protected from the N.W. by a curiously formed lava dike, jutting out into the sea so as to form a small harbour, in which, but for a sunken rock in its centre that a few pounds of dynamite would easily remove, a single small steamer of 300 or 400 tons might almost always lie in safety. The breakwater presents the appearance of a confusedly heaped-up mass of enormous blocks of lava partially fused together and variously weather and water-worn, over which we alternately climbed and scrambled, aided by an occasional bridge of roughhewn plank or untrimmed tree trunk, and guided by the marks worn into the hard rock by the naked feet of generations of islanders. Observation Bay of the Admiralty chart affords a safe and comfortable anchorage when the wind blows from the north, and landing is very easy at the feet of the cliffs here, either at the sandy beach called Boroaza by the inhabitants, whence a path to the east ascends the cliff to the village of Suyeyoshi, or on the shingle further west which is known by the names of Akiongô and Shôma. From the latter, a very steep climb up the cliff and a walk of about half an hour conduct to Nakanogô. Hachijô is usually supposed to be extremely difficult of access, but owing to its position N. W. and S. E. it is more than probable that landing would be possible at all times at one of the four places above mentioned.

Digitized by Google

The structure of the island is entirely volcanic. The thickness and great inclination of many of the lava beds seem to indicate the existence at some remote period of mighty centres of volcanic outflow and disturbance, and the depth of the tufaceous strata with which the lava alternates, points in the same direction. The axis of elevation follows the line of the lofty arête that forms the backbone of the island, and a careful examination, which, as already observed, must be extremely difficult, owing to the dense pathless woods that hide the slopes and summits of the hills, would probably reveal the traces of on immense crater more or less effaced by subsequent outbursts, and nearer the southern than the northern extremity of the island. Nearly all the lava we saw appeared to be of a basaltic nature, but on the eastern coast pumice and other signs of trachytic rock are from time to time to be met with. The northern end of the island appears to be the most recently formed portion of it. The wide undulating plain that separates the slopes of Fuji-san from the steep declivities presented by the northern termination of the mountainous backbone of the island, is covered with intersecting lava beds and with a profusion of blocks of lava, stones and scoriæ ejected from the comparatively recently extinct crater. These fragments have been collected and arranged by the hand of man in rudely formed walls or dikes, which cover the cultivated portion of the plain with a polygonal network, that would be unsightly but for the wonderfully luxuriant growth of ferns, chiefly Nephrolepis cordifolia and Niphobolus lingua, under the greenery of which they are more or less concealed.

The inhabitants of the island are nearly all occupied in the cultivation of the soil, more of which is reclaimed every year. Nearly all the lower ground and hills near the coast having been long ago brought under cultivation, the process of clearing is gradually invading the slopes of the southern mountain, where terraces for potato-planting have been formed as high as a thousand feet above the sea. Rice and barley are grown in favourable

Digitized by Google

spots, and the grain raised seems to be of fair quality, but the Satsuma potato (Batatas edulis), according to the statements made to us, appears to form the staple food of the islanders, and to be produced in much larger quantities than the other two articles. A sort of spirit, the manufacture of which was introduced by a Satsuma exile some five and twenty years back, is distilled in a primitive manner from this root, and appears to form the principal beverage on festive occasions, and we were given to understand by not a few of the inhabitants that it was their chief source of happiness, and indeed almost the only thing that made life worth having in Hachijô. Besides the potato brandy, they also brew from rice small quantities of a kind of beer called *nigori-zake*, which resembles slate-pencil dust stirred up in muddy water, and tastes somewhat like very sour vin ordinaire. The common food of the poorer class of the population consists either of Satsuma potatoes or of barley boiled with the chopped leaves of a vegetable called *ashita-na* (Angelica Kiusiana, Max.) A species of Colocasia is cultivated in a few swamp places, and furnishes the tuber called *sato-imo* in Japanese. Fish is very rarely an article of food, as it can be procured only in calm weather, either by fishing with a hook and line, or by diving. This latter method consists in pursuing the fish with a barbed point fastened to a long cord, and fitted on to the end of an iron skewer furnished with a wooden handle. When the diver finds himself near enough he stabs the fish, which makes off, carrying the barbed point attached to the cord, leaving the skewer in the diver's hand, and after it has tired itself out, it is easily secured and brought to land. Shell-fish are also procured by diving at particular seasons. During the winter a small haliotis (perhaps the young of haliotis tuberculata) called *abuki* is easily obtained in Observation Bay, and in the summer time a large trochus called *mettô* by the islanders is washed up on the coast. To judge by the shell heaps in the neighbourhood of all the villages, there must also be a considerable consumption of limpets

Digitized by Google

and of shellfish related to the periwinkle and other whorls.

Arable land appears to command a high price, and several plots were pointed out to us the value of which was said to be as much as 12 *yen* per 64 *tsubo*, that being the unit of measurement. Sixty-four *tsubo*, or a piece sixteen yards square is usually sown with 5 *gô* of corn-seed, but it is nominally supposed to require twice that quantity, and hence the term *is shô maki*, which is used to denote the unit. At this rate the best land must be worth a little over £42 an acre, taking the *yen* at three shillings and nine pence, which is about the present rate of exchange. The land tax is estimated and paid neither in money nor in rice, as is the usual practice in Japan, but in silk fabrics. The assessment of the land is at the rate of one skein of forty turns of the wheel for each of the units as above stated, and the quantity of raw silk thus obtained has to be woven into the rough fabric called *tsumugi*, but as the peasants are allowed to pay one piece (*tan* = 35 feet) of the fine dyed silk for five of *tsumugi*, that is the form which the tax practically takes. The whole annual amount for the three islands is 713 pieces of white *tsumugi*, (of which Hachijô pays the greater part) paid as beforesaid in the dyed fabric, commonly called Tango shima. The chief colours of this stuff are a yellowish red, chocolate and black, which are said to be obtained from the roots of plants and the bark of trees peculiar to the island, and to be fixed by means which are unknown upon the mainland. Hence a considerable quantity of raw silk is imported annually from Yedo by a few of the richer farmers, and after being dyed and woven, the material is exported as genuine Hachijô. The value ranges from 2 *yen* per piece for the inferior sorts up to thirty, forty and fifty for the finest fabrics, which are beautifully woven in a kind of diapered raised pattern, called *aya* by the Japanese. What is sold as Hachijô, but is only a fraudulent imitation, is manufactured in considerable quantities on the mainland. The amount of raw silk actually produced

Digitized by Google

in the island seems not to be large, but we could obtain no precise statistics under this head.

Besides silkweaving, the only other manufacture carried on is that of salt from seawater, which is obtained in an extremely wasteful and primitive manner. Owing to the fact that the coast of Hachijô is rocky, there are no tracts of level sandy soil on the seashore suitable for the construction of salt pans, and the only remaining method appears to be simple evaporation of seawater. Each of the five villages possesses in as close proximity to the sea as possible, a little hut with two or three shallow iron boilers supported on beds of rock and lime, the common property of its inhabitants, who take it in turn during the winter months to manufacture as much salt as each household may require. The fuel is chiefly evergreen oak (quercus cuspidata) which they cut in the hills, and bring down on the back of their pack-cattle. Seawater is obtained in most places by dropping a bucket into the sea, and conveying it over a rickety bridge from rock to rock back to the hut, to fill the reservoir from which the salt-burners are continuously replenishing the boilers. The production of three such boilers is about a *Koku* (nearly 5 bushels) in twenty-four hours, the price of which, whenever under rare circumstances any one who has no time to make his own salt, buys it from another, is a little over a *yen*, or about four shillings. It seemed to be the universal opinion of the men whom we found employed in salt making that the manufacture could not possibly be profitable at such a price, owing to the immense consumption of fuel, and the only reason for pursuing it is that salt is an article extremely liable to damage and loss on board of Japanese junks, and they therefore do not attempt to obtain it from the mainland.

As may be readily supposed, there are no shops or inns on the island, but fair accommodation for travellers can be obtained at the farmers' houses. These are for the most part substantially built cottages of two or three rooms with a spacious kitchen, constructed with the timber of quercus cuspidata, and with plank walls where on

Digitized by Google

the mainland it is usual to have plastered wattles. The roof is invariably of thatch, with a very high pitch, necessitated, we were told, by the extreme dampness of the climate, which renders it desirable to allow as little rain as possible to soak into the straw. Many of the more prosperous farmers have a second building, devoted to the rearing of silkworms, which takes its name *kaiko-ya* from the purpose to which it is destined. There are also sheds for cattle, usually consisting of a thatched roof resting on walls formed of rough stone work. Lastly, each enclosure possesses a wooden godown raised some four feet from the ground on stout wooden posts, crowned with broad caps, to prevent the mice from gaining an entrance. The style resembles that of the storehouses constructed by the Ainos and Loochooans. The house and vegetable-garden belonging to it are usually surrounded by a stone wall, or rather bank of stones and earth, often six feet high, designed to protect the buildings from the violent gales which at certain seasons sweep over the island, and which, as we learnt, frequently do serious injury to the rice-fields by the quantity of salt spray which they carry a long distance inland from the shore.

There are at present no paid government officials resident in the island, which together with the rest of the chain from Vries Island southwards, has lately been transferred from the jurisdiction of the Shizuoka prefecture to that of the City of Yedo, or Tôkiyô-fu. Up to the present, the native municipal officers, or mayors, seem to have been quite competent to preserve order and to administer the local affairs of the island. The central seat of authority is at the village of Ôkagô, at a building called the *jimusho*, set apart for the transaction of public business.

In their general habits of life the people do not appear to differ greatly from the agricultural population of any other part of Japan. Fishing is with them an occasional pursuit, and hunting is necessarily almost unknown in an island where the only kind of game is a wild pigeon. As

Digitized by Google

elsewhere, the men occupy themselves chiefly with cultivating the ground and cutting wood, and in their leisure hours they appear to smoke a good deal of bad leaf tobacco, grown in the island, and to drink as much potato spirit as possible. Real *sake* from the mainland is a great rarity, and many of the inhabitants of Hachijô, says a M. S. account of the island, live and die without tasting it, but they can have abundance of *nigorizake*. Concerning this beverage, the same writer says that whoever drinks his fill of it overnight will not require any solid food next day, and herein seems to lie the explanation of the fact that the single word *ke* in old Japanese was applied both to the rice when boiled and to the liquor brewed from it, which in those early days probably more resembled the thick substantial beverage of the rustic than the refined and carefully classified drink produced in the neighbourhood of Ôsaka for civilized palates. The women take no part in field-work, but busy themselves with the domestic duties proper to their sex, to which they add the breeding of silkworms, the preparation of the thread and the labours of the loom. It has been said that owing to the fact that the tax or tribute paid to the Government is the product of their industry, they occupy a much more important position in the family than elsewhere in Japan, but it was of course impossible to obtain a disinterested statement on this point from the men; and the value of the assertion could only be satisfactorily ascertained by close and lengthened observation, which the week we spent on the island did not enable us to make. Still we were able to perceive that the women are by no means hardly treated, and that they enjoy as high a degree of social freedom as anywhere in the world. Their dress consists of an under-gown fastened by a narrow girdle tied in front, and over this in winter they throw a loose sort of bed-gown, which is not fastened at all, and gives them a very untidy appearance. On the other hand they wear no false hair, but simply comb their long tresses upwards, all round the head, and tie them in a double bow knot, bound with a broad fillet of thick

Digitized by Google

white paper, which lies over the back of the head, a little on one side, and looks very picturesque. This head-dress is adorned simply with the wooden comb used in its arrangement, hair-pins and bodkins being unknown. Neither do the women paint their faces with white-lead powder, colour their lips with the safflower dye, or shave their eyebrows, though wives blacken their teeth, according to the usual Japanese custom. It was evident from the reply of a girl whom we questioned on this subject that though blackening the teeth is considered no disfigurement, the want of eyebrows would be thought hideous. Their intellects are as little cultivated as their persons are unadorned, if it be true, as we were repeatedly told, that there is not a woman in the island who can read or write a single word, and a company of a dozen whom we tested with a well-known verse from the "Century of Poets" showed entire ignorance of what nearly every Japanese child, however badly educated, knows by heart.

All the islands of this chain, from Vries, Rishima, Niijima, Miyake and Mikura down to Hachijô and the adjacent island of Koshima have been used as places of banishment for criminals, whose offences, owing to mitigating circumstances or to the social position of the offenders, were not held to be deserving of death. The earliest case recorded in history is that of Tametomo, the famous bowman, concerning whom so many fables are current among the Japanese people. This hero was a member of the Minamoto family, and after succumbing with the rest of his family in the first unsuccessful struggle which they made in the middle of the 12th century against the usurpations of the Taira, was banished to Vries Island, whence he is said to have successively visited the rest of the chain, and finally crossed over to the Loochooan group. The Loochooans believe that he was the parent of Shunten, who ascended the throne of Loochoo in 1187, and was the first of a dynasty which terminated with the third sovereign of the line. According to the popular legend, Tametomo found Hachijô inhabited solely by women, whose husbands dwelt on the island Awo ga shima

Digitized by Google

(then called Oni ga shima, the island of demons) 88 miles distant in a southerly direction. Once a year the sea god allowed a southerly wind to blow, of which the men took advantage in order to visit their wives, and hence has arisen the popular Japanese saying which ascribes large families to the effects of the south wind. The offspring of their hasty unions was divided between the parents, the girls being retained in Hachijô, and the boys being sent to join their fathers. One feels tempted to ask how the authors of such a legend supposed that male infants could be reared if separated from their mothers, and left entirely to the care of the male sex. The legend continues to say that Tametomo demonstrated to the women that they misunderstood the intentions of the sea god, that no harm could result from husbands and wives living together, and persuaded them to send for the men, thus putting an end to the ancient arrangement. At the present day, the women are said to outnumber the men on Hachijô, and such a belief transmitted in a vague and misty manner to the mainland, may easily have given rise to the fable that there was an island inhabited exclusively by women. Nothing seems to be known with certainty about the manner in which Hachijô was first peopled. The legend that the original inhabitants were the Chinese who accompanied Sü She (徐市 or 徐福) on his unsuccessful expedition in search of the Elixir of Life in the reign of Ts'in She Hwang-ti (Shin no Shikôtei, B.C. 221-209) may be dismissed as being absolutely without foundation, nor is there any reason to accept the story of Tametomo's visit as being in any way based on fact. The earliest mention of the island is in the History of the Odawara Hôjô (北條五代記) published in 1659, which states that in the time of Hôjô Sôun (早雲) the island was discovered, and annexed to the province of Idzu. Sôun was born in 1432 and died in 1519. The Sansai-dzuye places the date of the discovery in 1487. It was he who established the system of taxation which has remained in force up to the present day. Iyeyasu was the first to make use of Hachijô as a place of

Digitized by Google

exile for political prisoners and other criminals, when he exiled thither Ukida Hideiye with his son and seven or eight retainers in the year 1603. This person was the only man of *daimiô* or princely rank ever banished to Hachijô; but two ladies of the Mikado's court were exiled thither about the same time. To these ladies is ascribed the introduction into the island dialect of certain words peculiar to the speech of the Kiyôto people. From 1597 down to 1866 the whole number of persons transported to Hachijô for various causes was 1606, of whom 861 received pardons and were permitted to return to the mainland. As they were not allowed to bring their wives, it was impossible for the criminals to found families which should take a place among the settled inhabitants, and it was only at a comparatively recent period that they were allowed to keep concubines under the name of *midzu-kumi* or 'water-drawers.' It would be a serious injustice to the Hachijô people to suppose that the island is inhabited by a population of criminals or by the descendants of convicts. Since the promulgation of the present penal code, by which correctional labour has been substituted for the penalty of exile, criminals are no longer transported to Hachijô, and the few remaining individuals of the class are such as are expecting a pardon shortly, or whose crimes are not yet expiated, even when judged by the comparatively lenient provisions of the modern criminal law.

We made the acquaintance of several of these persons. One had originally been a monk of the Honguanji at Kiyôto, but had quitted the 'black robe' to enter the service of a retainer of the *daimiô* of Tosa. After accompanying into the field the troops which were engaged in the reduction of Aidzu in 1868, he returned to Yedo, and had the misfortune to wound a comrade in a quarrel, for which he was punished with perpetual exile. He had returned to his original profession, in which he had conducted himself so well that a pardon had been promised to him. The eagerness with which he anticipated the pleasure of walking again through the streets of Yedo was very touching.

Digitized by Google

In the course of conversation he informed us that the exiles were not confined, but had complete liberty of movement. On the arrival of a batch of prisoners lots were drawn for them by the mayors of the five villages, to whom they were assigned as servants or slaves, bound to work in return for board and lodging, but as it often happened that they belonged to families in easy circumstances, they could arrange to be freed from labour, and many of them bought land to cultivate on their own account, or lived in houses which they rented from the islanders. The poorer were obliged to work in the fields or to support themselves by making straw sandals. An exile who was guilty of a fresh crime at his place of banishment was sent over to the tiny island of Koshima, which seems to be a much less desirable place of residence, although there are actually two villages on it. Those who behaved well were either pardoned outright or were permitted to change their abode to Mikura or Miyake, islands nearer to the mainland, where the pangs of separation from home would be felt less acutely.

A second exile who came to call upon us, named Kondô Tomizô, said that his crime, for which he had been banished fifty years back, had been the murder of half a dozen or so of innocent people. His father, who was a *hatamoto* or lesser vassal of the Tokugawa family, had been on a mission to Kiyôto, in which he had failed to acquit himself to the satisfaction of his official chiefs, and on returning to Yedo, fell into disgrace. A farmer from whom he had leased some land for a country house took advantage of this circumstance to bring a plaint against him for taking more ground than he was entitled to by agreement, and the son thought it his duty to defend his father's honour, and killed the farmer with several others, amongst them a woman. It was no doubt the excuse of filial piety that saved his life, but he said to us with a smile: "the real truth was, I was in love with a girl, whom I thought my father would give me if I rendered him a service. So you see there was a woman at the bottom of it all." Having lived so long on the island

Digitized by Google

with nothing to do, this man has turned his time to good account in collecting information concerning his place of exile, and is considered a great authority by the inhabitants on all matters concerning its past history. He resides at Mitsune.

A third exile, who has lately been pardoned and has elected to pass the remainder of his life in Hachijô with his son, the offspring of a 'water-drawer,' was originally a monk of Zojôji, the principal burial temple of the Shôguns in Yedo, whence he was promoted to the headship of a small temple or monastery at Senji, one of the suburbs. Under the government of the Shôguns the police never intruded themselves into the district set apart for the residence of public women, and it consequently happened that men whose profession should have kept them away from those precincts sometimes strayed thither, and diverted themselves with the company of courtesans and singing-women, accompanied by the *sake* bottle. On the night of the 25th day of the first moon, twenty years ago, this rule was suddenly broken through by the police, who made a descent on all the houses of public resort at Shinagawa, Shinjiku, Itabashi, Senji and the Yoshiwara, and arrested every person who had no business to be there. Our friend, having been tempted by some jolly companions for the first time in his life to partake of these forbidden pleasures, was captured along with many others of the same cloth. The priests of the Montô sect, who are permitted by the rule of their order to marry and eat meat, were dismissed with a severe reprimand; those of other sects who held a subordinate rank in the hierarchy were let off with three days' pillory at the Nihon-bashi, as was the custom in those days, while he, who occupied a responsible position as head of a religious establishment, was punished with exile for life.

Customs of *tabi* and *ubuya*.

Two ancient customs have survived in Hachijô which are extinct in most other parts of Japan. One of these, to which the name *tabi* was given (? Chinese *ta* 袋

Digitized by Google

other, and Japanese *hi* 火 fire), obliged every woman to live apart from the rest of the household for seven days during each month, when she was supposed to be unclean, and she might not partake of food cooked at the same fire as that of the other members of the family. This custom existed within the present century at Kumano in Kishiu and in the neighbourhood of the famous temples of Isé. In earlier times (we are speaking of the Hachijô practice) the woman was driven out into the mountains, where she remained alone in a tent during the period of her seclusion. She had to prepare her own food, and was supposed to hold intercourse with no human being, though it is said that the monthly banishment was often taken advantage of for holding clandestine meetings with a lover, and the women used sometimes to prolong their absence from home more than was necessary. The hardship of the arrangement was lessened when the huts in which they were lodged came to be built inside the homestead, and at the present time the woman's separation is limited to her sleeping and eating apart, while she is quite free to mingle with the other members of the household and to share their employments. On the island of Koshima an additional three days' purification has to be undergone by the woman, after the cause of her uncleanness has ceased to exist, but in Hachijô she simply takes a bath by way of lustration. Whether this bath is really a form of lustration, or merely a resumption of the practice of periodical bathing, which all Japanese women discontinue during the period of their uncleanness appears uncertain.

According to the ancient religious belief of the Japanese, child-birth was another cause of uncleanness, and the woman in labour had to occupy a separate hut built for the occasion, in which she was supposed to remain cut off from all intercourse with her fellow-creatures: for the defilement ceased not with her, but extended to every one with whom she held communication. In Hachijô women, when about to become mothers, were formerly driven out to the huts on the mountain-side, and according to the

Digitized by Google

accounts of native writers, left to shift for themselves, the result not unfrequently being the death of the newborn infant, or if it survived the rude circumstances under which it first saw the light, the seeds of disease were sown which clung to it throughout its after life. The rule of non-intercourse was so strictly enforced, that the woman was not allowed to leave the hut even to visit her own parents at the point of death, and besides the injurious effects that this solitary confinement must have had on the wives themselves, their prolonged absence was a serious loss to households, where there were elder children and large establishments to be superintended. The rigour of the custom was so far relaxed in modern times, that the huts were no longer built on the hills, but were constructed inside the homestead. It was a subject of wonder to people from other parts of Japan that the senseless practice should still be kept up, and its abolition was often recommended, but the administration of the Shôguns was not animated by a reforming spirit, and it remained for the Government of the Mikado to exhort the islanders to abandon this and the previously mentioned custom. They are therefore no longer sanctioned by official authority and the force of social opinion against them is increasing, so that before long these relics of ancient ceremonial religion will in all probability have disappeared from the group of islands.

Botany.

The flora of volcanic islands is always of moderate interest, compared with that of islands separated from existing, or left behind by submerged, continents. The flora of the latter often affords valuable and interesting information, and preserves records of the past that would otherwise have become obliterated, assisting to fill up gaps in the life history of plants which we should be at a loss to bridge over, without the survival of ancient forms that such islands render possible. Of a volcanic island, on the other hand, the flora is usually a mere chance colony, the individuals of which are descended from types

Digitized by Google

brought by casual agencies from neighbouring islands and continents. Seeds are wafted over by the winds, or borne more hazardously by the waves, to the shores of the newly formed island, but the principal agency concerned in the colonization no doubt, is that of birds. Hence no features of special interest attach to the flora of a volcanic island, which is simply a casual selection from existing floras, preserving perhaps a few species that may have become extinct in their original domicile, but not otherwise helping us to decipher the past or complete the chain of organic life, interrupted at so many points.

The flora of Hachijô seems, so far as we were able at an unfavourable season of the year to investigate it, mainly Japanese in character. We saw nothing not known in Japan, unless a fern tree, which we were unable to determine, should prove an exception. No signs of distinctively tropical vegetation anywhere presented themselves to our observation, and the flora of this island would appear to be distinguishable from that of the mainland rather by the absence of types common in the Japanese islands than by the presence of forms not found there. The common dandelion, so abundant in the vicinity of the Treaty ports, we searched for carefully, but did not meet with a single specimen. In the interior of Japan, for instance, about Asama-yama, it appears to be uncommon if not absent, and it is possible that it is an introduced weed. The Japanese name '*tampopó*' would seem to corroborate this this view, for the word is hardly of Japanese origin. Of the common Shepherd's purse we saw only a few plants, near Nakanogô—though we looked for it in all our rambles. Of the usual oaks, Quercus serrata and Q. glauca we did not see a single example, and nearly all the common ferns were absent. The remarkable leguminous genera Lespedeza, Sophora, Æschinomene, Indigofera, Desmodium and Pueraria were not represented by a single species, so far as our observations extended. It must, however, be remembered that the season was early, and but few flowers would be out to attract our attention. But the leafage of the commoner species that

Digitized by Google

grow in the neighbourhood of the treaty ports (excepting Hakodate) was tolerably familiar to us, and we should hardly have missed any of those had they been aught but very rare, to say the least, in the tracts we investigated. We were struck by the paucity of crowfoots; Ranunculus ternatus and R. sceleratus we observed, but not in any abundance, while of the common genera Thalictrum and Anemone we did not come across a single species. An aconite was once seen, but not in flower. Among Lardizabaleæ only Stauntonia hexaphylla was found, and neither of the common Akebias was met with. A stout Corydalis (C. pallida, Papaveraceæ) with pale yellow flowers was common enough. Cardamine sylvatica, a cruciferous weed, was not infrequent. The pale Viola grypoceras we observed on sunny banks, but it was not common.

Eurya japonica (Ternstrœmiaceæ) was the commonest shrub and low tree on the island. It was in full flower and its disagreeable odour was everywhere strongly perceptible. Camellias were nearly as universal as the Eurya; most of the villages were built in the midst of camellia groves, which served as a protection against the high winds. We looked for Stachyurus and Cleyera, but without success. Skimmia japonica (Rutaceæ) was met with once or twice, but Trochodendron aralioides was growing high up on the southern mountain group round a clearing in the middle of the great basin of which we have spoken, not in flower. A Celastrum which we have not been able to determine was found on the road from Mitsune to Suyeyoshi, and a strong smelling Ilex in full bloom of which we have not seen a specimen in Japan. We did not observe any wild vines. A saxifrage (S. sarmentosa) was common enough on damp walls and rock surfaces, and Chrysoplenium alternifolium was almost equally frequent in ditches and on wet banks. It was an omission on our part that we did not look more closely for examples of this difficult and interesting genus of which Dr. Savatier has discovered six new species in Japan, two of them belonging to the Dialysplenium divi-

Digitized by Google

sion. We saw Hydrangeæ about a thousand feet above the sea on both mountains, but did not notice the leafage of Deutzia anywhere. The rougher faced rocks about the beach showed tufts of a Sedum, not in flower, probably S. japonicum. No Umbelliferæ presented themselves in flower or fruit; the order indeed seemed poorly represented, for we remember nothing but Angelica Kiusiana abundant in the fields, and another, probably A. decursiva, among the boulders on the seashore. Ivy grew in profuse luxuriance everywhere, but neither of the Aralias so common on the mainland were observed. Various species of Galium, which we omitted however to examine closely, and their congener Rubia cordifolia, so frequent a climber in Japanese hedges, were seen. The pretty lilac flowers of Scabiosa were absent, and not very many composites were noticed. Among others the Japanese *fuki* (Petasites Japonicus), Solidago virga-aurea, a Bidens, Pyrethrum Decaisneanum, P. sinense, a Gnaphalium, several Cnicus (Plume thistles), Picris japonica and an Ixeris. Lysimachia lubinioides, not in flower, a fleshy-leaved species common about Yenoshima, was the only primulaceous plant we came across. We did not observe any persimmon trees, though these grow in the island, and the common Styrax japonicum, with its abundant and beautiful wax-white flowers was nowhere seen. Very few climbing plants, so distinctive of the mainland flora, were met with, no Asclepiads, vines or cucurbitaceous species. One Gentian, the minute ultramarine G. squarrosa, was found growing on sunny banks near Suyeyoshi. The few Labiates and Scrophularineæ we saw were not in flower, and we did not examine them very closely. Nepeta Glechoma, what looked like Scutellaria indica, a Leonurus and an Ajuga (?) appeared to be the principal species. Of Plantagos there were several. The Polygonaceous order seemed poorly represented, a Rumex, probably R. japonicus, and what looked like R. persicaria being all we noticed. The only Daphnad was one of the herbs Wikstrœmia. We saw no mistletoe (Viscum). The magnificent Euphorbia we have referred to was

Digitized by Google

very abundant in one place near Ôkagô. We have determined it to be E. Jolkini, but not without some hesitation. Eleagnus macrophylla was a common tree throughout the island. A Cinnamomum (not C. camphora) and a Machilus grew in fair abundance. We searched for but could find no traces of the interesting genus Asarum. A Daphniphyllum, D. glaucescens or macropodum, was found on Fujisan. The common Japanese weed, Houttynia cordata, we did not meet with, nor did we see Saururus or Chloranthus. A Bœhmeria was extremely common on the coast everywhere. Quercus cuspidata was the only oak we could determine, there were probably other species indigenous to the island. The Alders, Alnus glutinosa (or viridis) and A. maritima were both common. A. maritima is largely cultivated as food for cattle, and for the sake of the fruits, which are used in dyeing. The common Japanese pine, P. Thunbergii, covered the lower grounds and hill slopes, mingled with Quercus cuspidata and other trees, and a bushy, close-leaved, very pretty stunted form was spread over the cinder and lava-covered plain at the base of Fujisan in luxuriant profusion. We saw a Juniper and a Torreya. Cycas revoluta is cultivated with great success, but does not appear to be indigenous. Of endogenous plants we shall say little. None were in flower except a Polygonatum. It was too early for any lilies to show. Several orchids were seen, one of which turned out to be a Dendrobium (D. moniliforme ?). Several species of Allium, too, were passed, and the prickles of Smilax China had to be avoided with almost as much care as on the mainland. One or two Arisæmas we also saw, but they were not in a sufficiently advanced state of inflorescence to be capable of being determined.

The floral glory of the island lay undoubtedly in the profusion and variety of its ferns. In Franchet and Savatier's Enumeratio thirty genera and one hundred and sixty-six species of ferns are mentioned as shown to occur in Japan. Of these we saw twenty genera represented in Hachijô—twenty-one, if the tree-fern be a Cyathea,

Digitized by Google

—and observed at least thirty-four species, together with several others which we could not absolutely determine specifically, and one, perhaps two, apparently new species. Both Gleichenias were abundant, especially in the woods and on the hill slopes. Gleichenia glauca (*ura-jiro*) grew to an immense size, the only place where we have seen it in equal luxuriance is the hill behind the Maruyama hotel at Kiyôto. This fern is common about Atami and Nagasaki. G. dichotoma was less abundant, but with similar habitat. Those who have visited Hongkong will remember that the hills of that paradise of botanists are covered with a luxuriant growth of this fern. It is not rare about Kiyôto. Whether the tree-fern that grows in the island wild, in only a few places, is Cyathea or not—or whether, if Cyathea, it is the C. spinulosa we were not able to determine, but probably it is the latter. The beautiful but most difficult genus Hymenophyllum covered the tree trunks at a height of a thousand feet and over ; below that elevation it was rare. We saw two forms which we set down provisionally as H. Barbatum, found by Wilford in Tsushima, and H. Japonicum. We noticed, generally mixed with Hymenophyllum, two species of Trichomanes, one the common T. parvulum of the mainland, the other a splendid variety with fronds often several inches long, which may be T. rigidum. The only Davallia we came across was a form of D. Chinensis. At high elevations, over 700 feet, Lindsaya cultrata, the only species of the genus known to exist in Japan, was fairly abundant. A variety of this, if not a distinct species, grew with it; on the mainland, we have never seen either. In one or two damp shady places on the cliffs close to the sea we came across quantities of true Maidenhair, Adiantum capillus veneris, which we have never found on the mainland. Onychium Japonicum *(shinobu)*, so well known in the neighbourhood of Yokohama, was met with frequently, and Pteris serrulata, a common species on the mainland, is common on the island, as well as what appeared to be a distinct form of P. aquilina (*warabi*). Both

Digitized by Google

of the Japanese Lomarias were met with, L. nipponica and L. euphlebia; the latter was rare. Woodwardia orientalis showed itself under a distinct form, of slighter make with thinner and narrower frond divisions than the mainland specimens. The great genus Asplenium was well represented; Asplenium nidus not very uncommon. The curious A. lanceum found, but rarely, about Atami, was one of the commonest ferns in the island, though conspicuously absent in certain localities. Among Aspidiæ we found that most of the forms common around Yokohama were deficient. A. aculeatum, however, was pretty abundant, and A. tripteron, so common about Miyanoshita was far from rare. We saw also A. aristatum, a very handsome species. A. viridescens, with which visitors to Ikegami ought to be familiar, was abundant, as well as A. uliginosum, common at Yenoshima, about Yokohama, near Hakone, and elsewhere. A. sophoroides was not very frequently met with.

Nephrolepis tuberosa, which we have never met with on the mainland in a wild state, was the commonest fern in the island, but far more abundant at the northern than at the southern end. The plain at the base of Fuji-san was literally covered with it, and this fern, and Niphobolus lingua, formed the most distinctive feature of the Pteridology of Hachijô. Niphobolus (Polypodium) lingua we have found near lake Biwa at Ishiyama. Both ferns are well known in gardens and would be at once recognized as familiar objects. The Nephrolepis is called aptly enough *nokogiri shida*, saw-fern, the long narrow pinnate frond with falcate pinnules in a regular row on either side of the rachis resemble well enough a double-edged deep-toothed saw. The Niphobolus is known to gardeners as *hitotsuba*, one-leaf; a straggling rhizome with stipes springing up at intervals, expanding into a lanceolate pointed simple frond often a foot long, thick and coriaceous, deep green on the upper side, brown below on the sterile fronds, on the fertile fronds covered with closely appressed naked sori of the colour of bright iron rust. The Hachijô people call it *tetsuba* in their

Digitized by Google

dialect. A favourite habitat was the tops of rough lava-walls or dikes, which often presented a sort of cheval-de-frise of them, and whence a cartload could have been gathered in half an hour. We should add that while we found P. lingua at all heights, Nephrolepis invariably disappeared at 600—800 feet. The other Polypodia we observed were the common P. lineare, some specimens of which were a foot long, and what we take for P. superficiale, a climbing or creeping fern with entire smooth fronds, on which are scattered about a number of yellowish brown sori. We only found it on tree trunks at high elevations. Gymnogramme Totta was common everywhere. The curious Vittaria lineata growing in tufts on damp tree trunks at high elevations, we took at first for some cœspitose grass: on finding it was a fern we sought for its determination among the Pterideæ, to which its marginal sori led us to look. But it turned to out to be a Vittaria, a species with which we were neither of us familiar. Drymoglossum carnosum, the odd-looking creeper on rock and trunk surfaces not uncommon about Yokohama, and known at once by its oval small fleshy sterile fronds,—the fertile ones long-obovate and having their whole under surfaces covered with confusedly packed brown sori—was very frequent. The Japanese name, a sufficiently apt one, is *ishi-mame*, rock bean. Osmunda regalis was not very common, but O. cinnamomea was plentiful at 1,500 to 2,000 feet elevation. Angiopteris evecta, never remarked by us on the mainland, was pretty frequently met with in dark nooks of the woods, and a few examples of Botrychium ternatum were picked up.

There were doubtless many species of Asplenium, Aspidium and Polypodium which we did not notice. The specific marks of these difficult and extensive genera are hard to recognize, and the pteridologist who wishes to make an exhaustive collection of them must reserve all his attention for their search.

Digitized by Google.

Dialect.

There is considerable difference between the language spoken in Hachijô and that of the nearest part of the Japanese mainland, and it is not too much to say that a new-comer, whether Japanese or foreigner, would at first be entirely at a loss to understand what the people around him were saying. It presents some of the peculiarities of the ancient dialect of the eastern provinces, while it resembles in many points the modern Kiyôto dialect. Many of the men have visited the capital or have picked up from stray visitors some of the characteristics of polished speech, which they do not fail to display whenever an opportunity presents itself, but the women are free from such affectation, and speak a language which, at first, sounds utterly unintelligible to a stranger. The number of words which differ entirely from the corresponding expressions in the standard Japanese is very great, the terminations of the verbs are likewise peculiar, and the notes upon which syllables are sounded are more diversified and extend over a wider range than in the speech of the metropolis. Some archaic words have been retained which have entirely dropped out of use in the ordinary colloquial, and primitive forms have been preserved which are invaluable helps to the etymology of words hitherto inexplicable; at the same time there are not a few which upon careful examination prove to be corruptions of comparatively modern words imported from the mainland, and perhaps misunderstood or applied incorrectly. In a M S. account of Hachijô in twenty or thirty volumes belonging to an inhabitant of Kashidaté we discovered the following amusing scene in the pure island dialect, with the stage-directions in ordinary standard Japanese. It appears to be the custom in Hachijô, as in many other parts of Japan, that when a girl arrives at a marriageable age, which on the island is understood to be on the average in the 18th year, the event is celebrated with great rejoicings. All the relations and friends of the family call to offer their congratulations on the auspicious occasion, loaded with presents, and the parents are ex-

Digitized by Google

pected to entertain their visitors with cakes and *nigori-zaké* (literally and truly 'muddy beer') according to their means. We will give the dialogue in island dialect with an interlinear translation, and turn the stage-directions at once into English.

'Arrives a woman of about forty, carrying according to custom, a sheaf of rice on her head, which she deposits at the door, and entering the house, she sits down by the hearth, crosses her legs and begins to smoke out of a pipe three feet long.

"Kori ya, Tarôji dono Takari anei, o mi tachi chô yo hana yo to kawaigatte bôku itaita nioko dono mo shitori mae no onago ni natta gena.

"Well, Brother Tarô and sister Takari! So it seems that Miss Prima whom you have cherished like a butterfly or a flower till she got big, has now become a full-grown woman.

Ware mo tokku ni yorokonde kubei kubei to omotte iru uchi ni, go buyen ni hinnari môshita. Kori ya, wa ga Sabôji mo, ammari hajikamashii koto da ga, o mimai ni ware yo oppashirakaita."

It is long since I rejoiced over it, and kept thinking I'd come to call, but in the meantime I have ended by neglecting you. Well, at last my Sabôji, I am quite ashamed to say it, sent me running hither to ask how you were."

Lights her pipe.

The father replies.

"Ashike koto ni, kechidô. Kori ya go shintei ni. Nioko me ni o sewa shite tamottaa. Unu ga iye e kayettara Sabô asei ni mo yoku bingi ya shite tamore yo. Wa ga nioko me mo mada kodomo daa, kodomo daa to omotte iru uchi, konaida tabi e haidetari gena. Go shintei ni ojatte tamotta. Kono tabako a, wa ga tedzukuri no yoke tabako da. Meere."

"Really, this is delightful. It is very kind of you. You are very good to my brat Prima. When you go home please remember me kindly to Brother Sabô. It seems that my brat Prima, who I thought was still a child, not long ago crept out to the house of retirement. You are very kind to call. This tobacco is some good tobacco of my own growing. Take some."

Digitized by Google

VISITOR (replies).

O, Tamorô ga. — Yes, I accept.

HUSBAND (to his wife).

Takari, sake de mo meerasero. — Takari, serve some beer.

VISITOR (cannot help overhearing, and protests).

Iiye, ware ya nominnô ga, tabako dara hetchogo kara deru hodo mo tamoru ga, sake ni a ware yô-nashi da. — No I don't drink, but if it's a question of tobacco, I will profit by your offer till the smoke comes out of my navel; but really I am no hand at beer.

HOST.

Sô iwazu to tetsu meere. — Don't say so, but just take one cup.

(To his wife).

Sore, Takari hayaku mairasero. Hayaku sake wo dase. — Here, Takari serve it up quickly. Bring out the beer quickly.

WIFE.

"Appaa anei, o jingi, yaa, shiyarazu to tetsu meere. — "Sister Appaa, take a cup without all this refusing.

(She pours *nigori-zake* into a bowl capable of holding a pint and a half.)

VISITOR.

Kechi dô. — Thank you.

(Takes the cup with an affectation of shamefacedness, and taking a sip draws a long breath. The host pretends to be wanted in the kitchen, and no sooner is his back turned than she empties the cup to the dregs.)

VISITOR.

Ware yaa kodomo wo nekashite oite kita kara mairu ka. Kori ya, go chisô ni hinnari-môshita, Takari anei. — I left the child asleep, so I must be off. Well, thanks for your hospitality, Sister Takari.

(And with these words she darts out of the house. The host starts out of the kitchen again).

Digitized by Google

Waa, ashike koto ni, ma tetsu meeri mo sezu hashitta. Kore, Sabôji ni mo asonde ojatte to.

Hollo! Here's a go! Why she has run off without taking a second cup. I say, tell Sabô to look in on us too.

(Calls he out in a loud voice, in true island fashion. In the meantime the cat has stolen a piece of dried bonito out of the meat-safe and run off with it, which the Host perceiving).

Waa haa, kono chikushô me.

Hollo! Hollo! Drat the brute!

(Pursues her with a cudgel, but the cat escapes from view.)

Waa haa, imaimashii chikushô mishaki no tedchi-sasari. Wa ga tashinami katôbushi yô itsu no ma ni hikidzuridashite, doko ka no tanashita e hikidzuri-konde, ima-goro wa hara-noshi wo suru dambei."

Hollo! Hollo! Confounded beast of a wandering ghost possessed by a hill-demon. She's carried off when I was not looking my favourite dried bonito, and at the present moment she has got it somewhere under the flooring and is filling out the wrinkles of her belly."

There is scarcely a single word in this dialogue which we did not hear used, and it may be accepted therefore as a fair specimen of the dialect. The following vocabulary contains all the expressions which present any peculiarity. Tarô, Takari, Sabô and Appaa are names of the dramatis personæ.

Hachijô.	*Standard Japanese.*	*Remarks.*
o mi tachi.....	o mae tachi....	you. *Mi* is 身, person.
anei	ane	elder sister.
bôku	ôkiku	big (adv. form).
itaita	itashita.....	made.
Nioko, name given to eldest daughters.		
kubei	koyô.....	will come. *bei* is a corruption of *beki* 可.
buyen	busata	neglecting to give an account of one's self.

Digitized by Google

Hachijô.	*Standard Japanese.*	*Remarks.*
hinnari-môshi-ta	itashimashita.	*hinnari=hikinari*, in which *hin* is merely an intensive prefix, like *ai, uchi, tori.*
hajikamashii...	hadzukashii...	Shameful.
oppashirakaita	tsukawashita..	*oppashirakaita* is a corruption of *oi-hashirakashita*, in which *oi* is prob. a mere intensive prefix like *op* (corruption of *oi*) in *oppeshoru*, to pluck, of the vulgar Yedo colloquial, *ot* of *ottateru*, to set up, etc.
ashike koto...	kori ya kori ya.	*ashike* is no doubt *ashiki*, bad, used like *tonda* in Yedo colloquial for 'out of-the way.'
kechi dŏ.....	arigatô..... ...	*dŏ* is *da*, but how does *kechi*, which in Yedo signifies 'paltry,' come to be used for 'thankful ?'
shintei	shinsetsu	prob. 心底, the bottom of the heart.
tamottaa	kudas'tta.....	*tamoru*, apparently a corruption of *tamawaru*, to receive as a gift, and applied as a transitive verb, is used also in the Kiyôto dialect in speaking to inferiors. It occurs frequently in the novellette Ukiyo Rokumai-biôbu.
uuu.....	.....	you (*onore*).
asei.	ani	*Se* is the archaic term for elder brother.
bingi.....	.....	tidings. In the Yedo dialect they say '*yoroshiku*,' with the same intent.

Digitized by Google

Hachijó.	*Standard Japanese.*	*Remarks.*
ojatte...	o ide nas'tte...	*ojaru*, probably a corruption of *o ide aru*, is used for to go, to come, and to be.
yoke.....	yoi	the literary form of the adj. slightly corrupted from *yoki* into *yoke*. The same happens with all adjectives in-*ki*,-*ku*,-*shi*.
meere	o agari nasare.	a corruption of *maire*, the old expression for 'partake of.' In some villages it is pronounced *miare*.
o.....	hai.....	yes. At Ôkagô the sound is more like *ŭ*.
ga.....	.....	nearly every sentence leaves off with *ga*, as if something still remained to be said. *g* is pronounced very hard.
nominnô.....	nomanai.....	compounded of *nomi*, the root of *nomu*, to drink and *nô* for *naku*, adv. form of *nai*, with its initial letter doubled.
dara	nara	in the Yedo dialect we find *da*, *darô*, *datte*, *datta*, but neither conditional nor concessive forms of this compound.
hetchogo.....	heso	navel.
tetsu.....	(s)hitotsu.....	one.
jingi	jigi	refusal.
shiyarazu to...	nasaranaide ...	*shi* to do and *yaru*, to give, used colloquially as an auxiliary verb, meaning to perform.

Digitized by Google

hinnarimôshita	narimashita ..	
mishaki	gaki	a hungry demon (Prêta).
tedchi	.....	name of a hob-goblin who dwells in the hills; perhaps the same as *detchi*, 'imp,' applied to little shop-boys in Yedo.
sasari	tsuki	to be possessed.
katôbushi.....	katsuwobushi.	dried bonito.
tana shita.....	en no shita....	*tana* is not merely a shelf, but means also platform, and hence the floor of a house; *en no shita* is strictly 'the beneath the verandah.'
haranoshi.....	haranobashi...	like *shiwanoshi* for *shiwanobashi*.
dambei	darô	will be, probably is.

The adjectives for the most part take *ke* as the termination of the attributive form, an evident corruption of the literary *ki*; thus *yoke ko*, a pretty girl, *bôke fune*, a big ship. Mr. Aston has pointed out to us that this termination *ke* of adjectives occurs in some poems in the Manyôshû, collected in the eastern provinces of Japan ten centuries ago, for example, *kanashike** occurs several times for *kanashiki*, *yasuke* for *yasuki*, *nayamashike*† for *nayamashiki*. Sometimes, however, adjectives terminate as in the standard colloquial, thus *nekkoi*, little, *tsurai*, melancholy. According to a tendency which prevails especially at Kashidate, this last word is pronounced *tsuria*, the two final vowels being reversed; and in like manner for *shimpai*, solicitude, one hears *shimpia*; for *hai no ki* (corruption of *hari no ki* or *han no ki*, the older) the people there say *hia no ki*; and for *hama e*, to the shore, they say *hamia*, which is a curious example of the manner in which the inflection of a substantive by altering

* Vol. XIV, 1st part, p. 25 l. 12; 2nd part p. 37 v. p. 12; *uraganashiki* 2nd part p. 17, l. 3; p. 33, l. 3; p. 32, l. 5.

† Vol. XIV, 2nd part, p. 35 v., l. 1.

Digitized by Google

a vowel of the root may orignate. In the same way, in the phrase *ishi nakia yûra ojarei*, go gently among the stones, *nakia* is said for *nakae*. The predicative form is simply the attributive with the *k* doubled, followed by the interjectional syllable *ya*, as *nakki ya*, there is not, *omokki ya*, it is heavy, *samukki ya*, it is cold. Here we have the vowel *i* of the literary dialect preserved to all appearance pure, but it may be merely a short *e*. In the verbs the only special difference was in the negative indicative present, which may be formed in two ways, as *nominnô* for *nomanai ; ojarinnô* for *gozaranû ; dekinnô* for *dekinai* ; *shirennô* for *shirenai*, or by substituting *naka* for *nô*, as *wakarinaka*, do not understand. This may be compared to the ordinary termination of the adjective in the Nagasaki and other Kiushiu dialects. The simple imperative often ends in *ro*, thus *dero*, go away ; *machiro* wait, but also in *e*, as *shaare* (perhaps a corruption of *sare)* be off ! *bupparae*, drive away ! There are three auxiliary imperatives in use, *tamore*, which occurs in the dialogue already given (not however as an imperative), *tabe* and *yare*. *Tabe* is usually thought to be confined to the literary language of the classical period ; it is no doubt the same word as *taberu*, to eat, which is no longer used in its original meaning of to bestow. It is therefore extremely interesting to find this sense of the word surviving in this remote island. *Hi wo kashite tabe*, give me some fire (to light my pipe), was almost the first phrase that we heard upon landing. *Yare* is the most courteous of the three, and is mostly used in familiar speech : thus *mise yare*, show me. It is found in the words *osshare* (contraction of *ohose shi yare*), tell me, and *irasshare*, come of the Yedo dialect, and more frequently in the Kiyôto dialect, as in *omowossharu*, to think, *iwassharu* to say ; in provincial dialects as *misassharu*, to see, *tabesassharu*, to eat. *Tamoru* and *yaru* are used as auxiliary verbs in all moods and tenses as well as the imperative, but we cannot affirm this of *tabe*. There are three ways of expressing a negative, namely *ojare naka* (or *ojarinnô ga*,) *nakkiya* and *nake zo*. The verb *butsu*, to beat, is

Digitized by Google

often prefixed merely to give force to the principal verb, thus *bukkorobu*, to fall down, *buttatsu*, to set out, and this without the slightest consciousness of the practice being inelegant, whereas in Yedo such forms as *buppajimeru* are only heard in the mouths of the lowest coolies.

Another peculiarity worth noticing is the tendency to drop the initial syllable, as in *ba* for *oba* aunt ; *ji* for *oji* uncle ; *taggo* for *futago* twins ; *ma* for *ima*, now : *tetsu* for (*s*) *hitotsu*, one. The recognition of this principle as applicable to Japanese etymology is of the greatest importance. It is probable that all words in the earliest state of the language known to us, which begin with a medial consonant, have lost an initial syllable ; as for instance *dani*, which Mabuchi, in our opinion justly, conjectures to be derived in this way from *tada ni*.

The following list contains words still current in the island, which appear to have survived from the ancient spoken language of Japan.

tommete, 'morning, a corruption of *tsutomete*, early, tomorrow morning. The initial *tsu* has been lost, and the *m* doubled, a common phenomenon in dialects.

ii, boiled rice.

tabu, rice plant ; corruption of *tabo*, from *ta*, rice field and *ho*, spike or ear, as distinguished from *okabo*, hill rice.

asake, morning meal, *ke*, archaic word for 'food'.

yûke, evening meal, *yufuke* in old Japanese, pronounced *yûke* at the present day. These two words occur repeatedly in the ancient Shintô prayers.

ama, ceiling.

makama, sickle. The prefix *ma* is archaic.

yameru, to be painful. Mr. Dallas tells us that the word occurs in the same sense in the modern dialect of Yonezawa.

ani, for *nani*, what. Also a common variation in dialects in the neighbourhood of Yedo. Mr. Aston has pointed out to us that in the poems already mentioned *aze*, *adoka* and *ani* are found for

Digitized by Google

naze, nadoka and *nani.* We have referred to the original passages, and find *aze* in a Sagami verse, (Vol. XIV. 1st part p. 10 v.) and in a Kôdzuke verse (ib. p. 32, l. 6), also in eastern provinces unascertained (2nd pt. p. 20, l. 11 ; p. 50. l. 12 ; p. 60., l. 9., p. 22 v., l. 4); *ado* for *nanito,* Vol. XIV, 1st pt., p. 14, l. 9 in a Musashi verse ; ib. p. 22, l. 10 in a Kôdzuke verse, also 2nd pt. p. 4, l. 5 ; p. 14 v., l. 8 ; p. 37 v. l. 12 ; p. 39 v. 11 ; and in a Hitachi verse *ado* for *nanizo* (XIV. p. 20, l. 6). [Riyakuge edition.]

yomu, to call. This word differs only from *yobu,* the ordinary form, by having *m* instead of *b,* but it is probably the more ancient. In most modern dialect *yomu* means 'to read,' originally 'to read aloud', while *yobu* is used for 'to call'. There can be no doubt of their identity. *m* and *b* are constantly interchangeable in Japanese, as *himo* and *hibo* for tape or ribbon.

manako, eye. (*me* is the original word, and *manako*= *menoko,* child of the eye, probably meant either the pupil or the iris. The Wakun Shiwori derives it from *menaka,* interior of the eye).

dekuru, to be feasible, instead of *dekiru. Dekuru* is common throughout the west of Japan from Kiyôto to Kagoshima.

miharukasu, to command a view of. *Miharasu* in the Yedo dialect is probably a corruption. *Miharukasu* is the earliest form, from *mi,* to see, and *haruka,* distant.

nigiri, right hand. *Migi* is the ordinary word in the standard dialects, but in country districts *migiri* is often heard, which is probably a corruption of *nigiri,* the grasper, from *nigiru,* to grasp.

menada, tears. *Namida* is the word in standard Japanese, and it might appear that either was a corruption of the other. The inversion of two adjacent syllables is a common phenomenon in

Digitized by Google

Japanese. Thus in the Manyôshû we find *tawayame* for *tayowame*, weak-handed woman, and in modern colloquial *tsumogori* instead of *tsugomori*, the last day of the month; *chamaga* for *chagama*, a boiler used for tea-making; *namagai* for *ma-na-gai* (real-food-shell, the Haliotis). Kaibara attempted to derive *namida* from *nakimidzutare*, crying water dropping, but it is at least quite as likely that *menada* is for *me no tare*, eye's drops, and that *namida* is a corruption of *menada*. Unfortunately for our hypothesis *menada* has not yet been discovered in the ancient Japanese-literature.

yajiki, pretty, is perhaps the same word as *hashiki* used in this sense in the Manyôshû.

tôge sama, a god. *Tôge* (*tafuge*) is explained by the most trustworthy Japanese etymologists to be another form of *tamuke*, offering, root of *tamukeru*, to offer, from *te*, hand and *mukeru*, to turn towards. It is ordinarily used to mean the summit of a mountain pass, where there is nearly always the temple of a god, to whom wayfarers are wont to make offerings. The use of *tôge* to signify a Shintô god wherever located is therefore worthy of notice.

naberu, to plant, is evidently connected both with *nameru* to place in a row, and *naye* (spelt *nahe*) a young plant.

tsuru, to bring along with one's self. *Tsureru* is the form generally used, but it is uncertain whether it is the most ancient. There has at all times been much confusion between the first and second conjugations. In old Japanese we find *kakuru*, to hide, instead of *kakureru* the modern form; the Kiyôto dialect has *karu*, to borrow, instead of *kariru*; in Satsuma *dekiru*, *miru* and *taberu* are treated as verbs of the first conjugation, and many other instances might be found.

tariko, rafter, is at least as old as the usual *taruki*.

Digitized by Google

There are also many words in the Hachijô dialect which are evident corruptions.

mijaku..... for *mijikaku*, short.
kii-mono ..... „ *kui-mono*, food.
go fuki ..... „ *go hiki*, five head (auxiliary numeral of animals.)
sap piki ..... „ *sam biki*, three head.
hoa ..... „ *haha*, mother.
kei bushi..... „ *kurubushi*, ankle-bone.
hetchogo ..... „ *heso*, navel.
ibi ..... „ *yubi*, finger (this is also heard in Yedo).
hege..... „ *hige*, beard.
yobi..... ..... „ *obi*, girdle.
hiôra (midday meal).. „ *hiôrô*, provisions supplied to soldiers.
heitei ..... „ *heiyei*, constantly.
senshô ..... „ *kenso*, steepness.

Tori-bikka, (servant) is said to be a corruption of *(s)hitori-hikuwan*. *Hikuwan* (被官) is an old word for the servant of a noble, and either Ukida or the exiled Court ladies already mentioned brought 'one' to the island, who was called the *(s)hitori-hikuwan*, and this compound was adopted by the inhabitants as a simple word for man-servant. *Mannô*, straight on, seems a corruption of *mawari naku*, or *nô*, without turning. *Me-narabe*, a young woman, is a corruption of *me-warabe*. *Hedaka*, back, is perhaps *senaka*. *Moshiki*, firewood, is from *mosu*, corruption of *moyasu*, to kindle, and *ki*, wood.

A few words are employed in senses which do not properly belong to them, as

marobu, to fall over, is used for to die.
bushô, lazy, „ dirty.
heta, unskilful, „ bad.
yowakute, weak, „ hungry.
yakata, shed, „ small house.

Other words and forms which seem peculiar to the dialect are,

tennei, heaven.
mija, earth.
tsugume, leg (lit. joint).
hagi, calf (*fukurappagi*).

Digitized by Google

hageta, mouth (*ha*, teeth and *keta*, square, as in *i-geta*, well-curb.)
tabu, *te no sara*, } palm of the hand.
nukaba, teeth.
michiki, temples.

hebira, clothes.
yoke hebira, *madara*, } fine clothes.
kako, cloth, or scraps of cloth.
tsube, roof pole.
amabashi, ladder (*ama* ceiling, *hashi*, ladder, bridge).
sugaki, sink.
bôya, big house.
kendon, bowl.
mogurushi, sieve.
kaibiô, lizard.
kimmanka, rich person.
wase, come.
bankei, evening (used also in Shikoku).
komahiru, ten o'clock a.m.
daisan, two ,. p.m.
daisan sagari, four o'clock p.m.
yayôshima, dusk.
toto sama, *tete*, } father (papa).
kakô, mother.
ô-ji, grand father.
basama, grand mother.

oya-ko, relations.
jii, younger brother.
anei, *inne*, } elder sister.
kiôdai, *ototo*, } younger sister.
mei-yôshi, niece.

goze, *yome*, } wife.
kata-ko, infant.
kongo, decrepit old man.
dongo, fool.
yango, bastard.
ohokata, lady.
The following names are used as familiar appellatives of boys, until they come of age.
eldest *Tarô*.
2nd *Jô* (*jirô*).
3rd *Sabô* (*saburô*).
4th *Shô* (*shirô*).
5th *Gorô*.
6th *Rokurô*.
7th *Shitchô* (*Shichirô*).
8th *Hatchô* (*Hatchirô*).
9th *Kutchô* (*Kurô*).
And for girls:
eldest *Nioko*.
2nd *Naka*.
3rd *Tego*.
4th *Kusu*.
5th *Jiurô*.
5th *Kûrû*.

Of the latter set *Nioko* is probably 女子 the first character being read as a Chinese word, the second as Japanese. But no etymology has been suggested for the remaining five words.

Digitized by Google

bussobeita, astounded (*? buchi-somuita*).
irou, to touch.
sedo-michi, narrow path.
awo, shatsuragi ya, annoying.
ware, I.
omee, you.
kinio, yesterday
ototsui, day before yesterday } also heard in Shikoku.
gawa, side (the Satsuma dialect also has this word).
fune ya maku, the ship sets sail.
yome dono, rat or mouse, a name evidently given by way of conciliating the animal.
magoroku, fool.

We have by no means exhausted all the peculiarities of this island dialect. The list might have been greatly extended by inserting all the local terms and idioms found in Japanese accounts of Hachijô, but we have thought it safer to confine ourselves to giving only those words and phrases which we ourselves collected during our visit.

Digitized by Google

APPENDIX I.

EXTRACT FROM CAPTAIN BEECHEY'S NARRATIVE,*

VOL. II.—p. 228.—THE BONIN ISLANDS.

"As the Islands to the Southward appeared to be the largest I proposed to examine them first, and finding they were fertile and likely to afford good anchorage, Lt. Belcher was sent in shore with a boat to search for a harbour. In the evening he returned with a favorable report and with a supply of fourteen large green turtle. We stood off and on for the night with very thick weather and at daylight, when by our reckoning the ship should have been seven miles from the land, we unexpectedly saw the rocks beneath the fog about a fifth of a mile distant, and had but just room to clear them by going about. The depth of water at the time was 60 fathoms, so that had it been blowing strong and necessary to anchor there would have been but an indifferent prospect of holding on any length of time. The great depth of water and the strong currents which set between the Islands must make the navigation near them hazardous during thick weather. On the evening preceding this unexpected event, we found so strong a current setting to the South West to windward, that though the ship was lying to, it was necessary frequently to bear away to prevent being drifted

* The full title is "NARRATIVE of a voyage to the Pacific and Behring's Strait, performed in H. M. ship Blossom, under the command of Captain E. W. Beechey, in the years 1825-28. London, 1831.

Digitized by Google

upon the land. When the fog cleared away on the 9th, we discovered a distant cluster of Islands bearing South 5° E. true. I therefore deferred anchoring in the Bay which Lt. Belcher had examined the preceding evening, in the hope of being able to examine the newly discovered Islands, but finding both current and wind against us and that the ship could scarcely gain ground in that direction, as there was no time to be lost, I returned to those first discovered. In running alongshore we observed an opening which appearing to afford better security than the before mentioned bay. The master was sent to explore, and returned with the welcome intelligence of having found a secure harbour in which the ship might remain with all winds. We were a little surprised when he came back to find two strangers in the boat, for we had no idea that these Islands had been recently visited; much less that there were any residents upon them, and we concluded that some unfortunate vessel had been cast away upon the Island. They proved to be part of a the crew of a whale ship belonging to London—the "William." This ship which had once belonged to His Majesty's service had been anchored in the harbour in deep water, and in rather an exposed situation, the port then not being well known, and had part of her cargo upon deck; when a violent gust of wind from the land drove her from her anchors and she struck upon a rock in a small bay close to the entrance, where in a short time she went to pieces.

"All the crew escaped and established themselves on shore as well as they could, and immediately commenced building a vessel from the wreck of the ship in which they intended to proceed to Manilla; but before she was completed another whaler, the 'Timor,' arrived and carried them all away, except the two visitors, who remained there behind at their own request. They had been several months upon the Island, during which time they had not shaved nor paid any attention to their dress, and were very odd looking beings. The master, Thomas Younger, had unfortunately been killed by the fall of a tree fifteen days after the loss of the ship, and was buried in a

Digitized by Google

sandy bay on the Eastern side of the harbour. We entered the port, and came to an anchor in the upper part of it in 18 fathoms almost landlocked.

"This harbour (Captain Beechey is now referring to Port Lloyd) is situated in the largest Island of the cluster, and has its entrance conspicuously marked by a bold high promontory on the southern side and a tall quoin shaped rock on the other. It is nearly surrounded by hills, and the plan of it upon paper suggests the idea of its being an extinguished crater. Almost every valley has a stream of water, and the mountains are clothed with trees, among which the areca oleracea and fan palms are conspicuous. There are several sandy bays, in which green turtle are sometimes so numerous that they quite hide the colour of the shore. The sea yields an abundance of fish, the rocks and caverns are the resort of crayfish and other shell-fish, and the shores are the refuge of snipe, plovers and wild pigeons. At the upper part of the port there is a small basin formed by coral reefs conveniently adapted for heaving a ship down, and on the whole it is a most desirable place of resort for a whale ship. By a board nailed against a tree it appeared that the port had been entered in September 1825 by an English ship named the 'Supply', which I believe to be the first authenticated visit made to the place.

"As the Harbour had no name, I called it Port Lloyd out of regard to the late Bishop of Oxford. The Island in which it is situated I named after Sir Robert Peel, His Majesty's Secretary of State for the Home Department.

"As we rowed on shore towards the basin which, in consequence of there being ten fathoms of water all over it, was named ten fathom hole, we were surrounded by sharks so daring and voracious that they bit at the oars and the boat's rudder, and though wounded with the boat hook returned several times to the attack.

"At the upper end of ten fathom hole, there were a great many green turtle and the crew were sent to turn som of them for our sea stock. The sharks, to the number of

Digitized by Google

forty at least, as soon as they observed these animals in confusion rushed in amongst them and, to the great danger of our people, endeavoured to seize them by the fins, several of which we noticed to have been bitten off. The turtle weighed from three to four hundredweight each, and were so inactive that had there been a sufficient number of men, the whole school might have been turned. Wittrein and his companion, the men whom we found upon the Island, were living on the south side of the harbour, in a house built from the planks of the 'William' upon a substantial foundation of copper bolts procured from the wreck of the ship by burning the timbers. They had a number of fine fat hogs, a well stocked pigeon house and several gardens, in which there were growing pumpkins, water melons, potatoes, sweet potatoes, and fricoli beans, and they had planted forty cocoa nut trees in other parts of the Bay. In such an establishment Wittrein found himself very comfortable, and contemplated getting a wife from the Sandwich Islands, but I am sorry to find that he soon relinquished the idea, and that there is now no person to take care of the gardens, which by due management might have become extremely useful to whale ships, the crews of which are often affected with scurvy on their arrival at this part of their voyage.

"The pigs, I have since learned, have become wild and numerous and will in a short time destroy all the roots, if not the cabbage trees, which at the time of our visit were abundant, and besides being a delicate vegetable, were no doubt an excellent antiscorbutic.

"We learned from Wittrein, who had remained eight months upon the Island, that in January of 1826 it had been visited by a tremendous storm and an earthquake, which shook the Island so violently, and the water at the same time rose so high, that he and his companion, thinking the island about to be swallowed up by the sea, fled to the hills for safety. This gale, which resembled the typhoons in the China sea, began at North and went round the compass by the Westward, blowing all the while with great violence and tearing up trees by the

Digitized by Google

roots. It destroyed the schooner which the crew of the 'William' had began to build, and washed the cargo of the ship which since her wreck had been floating about the Bay, up into the country. By the appearance of some of the casks the water must have risen twelve feet above the usual level.

"We were informed that during winter there is much bad weather from the North and North-west, but as summer approaches, these winds abate and are succeeded by others from the Southward and South-eastward, which prevail throughout that season and are generally attended with fine weather, with the exception of fogs which are very prevalent. Shocks of earthquake are frequently felt during the winter, and Wittrein and his companion repeatedly observed smoke issuing from the summits of the hills on the Island to the Northward. Peel Island, in which we anchored, is entirely volcanic, and there is every appearance of the others to the Northward being of the same formation.

"They have deep water all round them, and ships must allow their safety to depend upon the lead, for although bottom may be gained at great depths between some of the Islands, yet that is not the case in other directions. We noticed basaltic columns in several parts of Port Lloyd, and in one place Mr. Collie (this gentleman was the surgeon of the ship) observed them divided into short lengths as at the Giants' Causeway: he also remarked at the head of the Bay in the bed of a small river from which we filled our water casks, a sort of tesselated pavement composed of upright angular columns placed side by side each about an inch in diameter and separated by horizontal fissures. It was the lower part of the Giants' causeway in miniature. Many of the rocks consisted of tuffaceous basalt of a grayish or greenish hue, frequently traversed by veins of petro-silex and contained numerous nodules of chalcedony or of cornelian and *plasma* (?). The zeolites are not so wanting, and the stilbilt in the lamellar foliated form is abundant. Olivine and hornblende are also common. The druses were often found containing

Digitized by Google

a watery substance, which had an astringent taste not unlike alum, but I did not succeed in collecting any of it.

" The coral animals have raised ledges and reefs of coral round almost all the Bays and have filled up the Northern part of the harbour, with the exception of ten fathom hole, which appears to be kept open by streams of water running into it, for it was observed here that the only accessible part of the beach was at the mouth of these streams.

" I have before observed that the hills about our anchorage were wooded from the water's edge nearly to their summits. There were found amongst these trees besides the cabbage and fan palm, the tamanu of Otaheite, the pandanus odoratissimus and a species of puraw, also some species of laurus, of urtica, the terminalia, dodonœa viscosa, eleocarpus serratus, &c. We collected some of the wood for building boats, and found it answer very well for knees, timbers, &c.

" We saw no wild animals of the mammalia class except the vampire bat, which was very tame. Some measured three feet across the wing, when fully extended, and were eight or nine in length in the body. We frequently saw them flying, but they were more fond of climbing about the trees and hanging by their hind claw, which appears to be their natural position when feeding. Some were observed with their young at their breast concealed by the wide membrane of their wing. The tongue of this animal is unusually large and furnished with fleshy papillæ on the upper surface. Here we also found another species of vespertilio. Of birds we saw some handsome brown herons with white crests, plovers, rails, snipe, wood pigeons and the common black crow, a small bird resembling a canary, and a grossbeak.

" They were very tame, and, until alarmed at the noise of a gun, suffered themselves to be approached. The sea abounded in fish, some of which were very beautiful in colour. We noticed the green fish mentioned at Gambier Island and a gold coloured fish of the same genus, both extremely splendid in their appearance.

Digitized by Google

"A dentex resembling our carp, a small ray fish and some large eels, one of which weighed twenty pounds, were caught in the fresh water. We took forty-four turtles on board for sea stock, besides consuming two a day while we remained in port, weighing each about three hundred weight.

"The weather during our stay was fine, but oppressively warm, and though we had no rain the atmosphere was generally saturated with moisture. There was a thick fog to windward of the Islands almost the whole of the time, but it dispersed on its passage over the Island and the lee side was generally clear.

"While our operations at the port were in progress Lt. Belcher circumnavigated Peel's Island in the cutter, and discovered a large Bay, at the south-east angle of the island, which afforded very secure anchorage from all winds except the south-east. As this is the prevalent wind during the Summer, it is not advisable to anchor there in that season. I named it Fulton Bay, in compliment to Dr. Fulton, late President of the Geological Society. Mr. Elson (this gentleman was the master or navigating officer of the *Blossom*) was also employed outside the harbour, and discovered some sunken rocks to the southward of the entrance to the port, on which account ships should not close the land in that direction so as to shut in two paps at the north-east angle of Port Lloyd with the south bluff of the harbour. With these objects open there is no danger.

"On the 15th June we put to sea from Port Lloyd, and finding the wind still from the southward and that we could not reach the islands in that direction without much loss of time, I bore away to ascertain the northern limit of the group. We ran along the western shore and at noon on the 16th observed the meridian altitude off the northernmost isles. The group consists of three clusters of islands lying nearly N. by E. and extending from the latitude of 27.44.35 N. to 26.30 N. and beyond, but that was the utmost of our view to the Southward. The Northern cluster consists of small Islands and pointed rocks and has

Digitized by Google

much broken ground about it, which renders caution necessary in approaching it. I distinguished it by the name of Parry's group, in compliment to the late Hydrographer, under whose command I had the pleasure to serve on the Northern Expedition. The middle cluster consists of three islands, of which Peel's Island, four miles and a fifth in length, is the largest. This group is nine miles and a quarter in length, and is divided by two channels so narrow that they can only be seen when abreast of them.

"Neither of them are navigable by shipping, the northern on account of rocks which render it impassable even by boats, and the other on account of rapid tides and eddies, which, as there is no anchoring ground, would most likely drift the ship upon the rocks.

"The Northern Island I named Stapleton and the centre Buckland in compliment to the Professor of Geology at Oxford. At the South-west angle of Buckland Island there is a sandy bay in which ships will find good anchorage, but they must be careful in bringing up to avoid being carried out of soundings by the current. I named it Walker's Bay after Mr. Walker of the Hydrographic Office. The Southern cluster is evidently that in which the whale ships commanded by Mr. Coffin anchored in 1823, who was the first to communicate its position to this country and who bestowed his own name upon the port. As the cluster was, however, left without any distinguishing appellation, I named it after Francis Bailey Esquire, late President of the Astronomical Society."

Digitized by Google

APPENDIX II.

Extract from the "*Nichi Nichi Shimbun*," Sept. 30, 1876.

(TRANSLATED BY JOSEPH LONGFORD, ESQ.)

We have received the following interesting information from Mr. Sawao Keitarô of the Kôchi *Ken*.

I went to the island of Hachijô in the month of May 1874, and returned thence to Yedo this month. I purpose publishing hereafter a volume containing a full record of my experiences in the island during that period, but as a long period must elapse before I can do so, and, as in the meantime some persons may proceed to those islands to whom my book may not be available when it appears, I now send the following main points of information to be published in a vacant space in your paper.

The island of Hachijô forms part of the province of Idzu, the distance from the mainland to it being less than fifty *ri*. It is in the extreme south of the seven islands, rises precipitously out of the water and is steep on all sides, with very rocky coasts. The sea is usually not very high, but at times becomes so, and there is not a single harbour, and only three places where ships may anchor, viz. Yaye in the district of Ôkagô, Kaminato in that of Mitsune, and Aigaye in that of Naka-no-gô. The inlets on it being full of rocks, the number of boats lost in them at the changes of the seasons is very great, and the islanders accordingly generally draw their boats up on the land. The length of the island from East and West is three *ri*, the breadth from North to South two *ri*, the

Digitized by Google

circumference being about 14 *ri*. There are five rural districts called Ôkagô, Mitsune, Suyeyoshi, Nakanogô and Kashidate. The number of houses in it is fully 1,500, the population about 10,000 more or less, the women being more numerous than the men. The officials are a Kochô, a Fuku-Kochô, and ward officials. There are only about fifteen persons undergoing the punishment of banishment. The climate is very hot and I saw no snow or ice even in the coldest part of the winter. It rains for six or seven tenths of the year. Cattle breed of themselves in the fields, and there are accordingly on the average four or five head belonging to every house. There are only four or five horses altogether in the island. The vegetation is very luxuriant, and the island is well suited for agriculture. The only mining product is sulphur. On closer examination of the plants and animals, I found that, besides the cattle and horses, there were nothing save cats and rats, which also breed of themselves in a wild state, and of birds, there were a few fowls and some others, but neither cranes, geese, wild geese, wild duck, mandarin duck, eagles, pheasants nor quails. Horse-flies abounded, as did also flies and fleas, which no device could keep off. Besides these there were numerous other insects, but I saw neither leeches, fireflies, bull-frogs, crickets or snakes. There being no fishermen, the consumption of fish is very small and confined to a few eels, carp and loach. The want of other fresh water fish is I suppose owing to the absence of great rivers. There are a few oysters and some laver. As to the plants, they resemble those of the mainland, and there are none on the mainland which cannot be produced in the island, all the cereals, vegetables and fruits being found there. About 1500 bags of rice are raised; the production of wheat is also large, nor are the other cereals found wanting. Potatoes and sweet potatoes are abundant, both vegetables and fruit are scanty, and great damage is done to the crops every year by storms. The quality of the soil is very bad, but it has been rendered fertile by the constant rain and the salt whirled up

Digitized by Google

from the sea by the wind, and the islanders therefore do not use any special manure for their crops, but leave their growth to nature. As to the manners of the people, no language could describe them. They are all of the lowest order, greed is pictured in their faces, their bodies are masses of dirt and emit an odour equally offensive to both mouth and nostrils. The men are dark and the women grape-coloured. Leprosy, syphilis, itch, intestinal worms and like diseases are very prevalent, especially among the women. The latter are entirely ignorant of any forms of politeness, and the men know but very little of them. Their intelligence is very low and falls far below that of children. Given over to drinking and gluttony, they neglect their avocations, and eight or nine-tenths of them are in consequence steeped in poverty. One can hardly bear to look on their food and clothing, the former being such that a rat or cat could not approach it. Their clothing is almost altogether rags, and in winter they therefore huddle about the hearth and in summer go about naked, men and women both wearing nothing save a loin cloth, and only entirely covering themselves in winter. Rice and other cereals are eaten in less than thirty houses, and even in those only by the masters of the house, the others eating potatoes, sweet potatoes, the roots and leaves of *ashitana* (Angelica Kiusiana). The food of the very lowest classes is such that cats or rats could not touch it, and is fit only to attract swarms of flies. Few of the islanders are acquainted with any forms of ceremony, and as for writing, etc. there are not ten of them able to record their daily business. The rewards and punishments are not uniform throughout the five districts, both being determined by the will of individuals. When the islanders and persons undergoing banishment gamble together, an unreasonable fine is levied on the latter, but the former are allowed to go scot-free. The banished persons' legs are sometimes fastened by iron rings to a tall post, and in this condition they are abandoned in the wild hills and left to starve to death. They are also

Digitized by Google

sent to the island of Kojima—a small island about two *ri* distance in a southerly direction from the district of Yayene in Hachijô, with a population of 150 persons of a lower order even than those in Hachijô. In this country they have a custom of burying people alive, and I believe that many of the banished persons have met with this fate. Some of them have also been strangled and others fined, and the system under which the fines are levied is like what children might use in sport; the amount is unaffected by the gravity or otherwise of the offence, and is decided solely by questions of partiality. The banished persons sometimes succeed in escaping the fines.

The islanders used to wreck all vessels cast on the island, seizing all money, food and implements that might have been on board them. They have recently somewhat improved in this respect. They allow a vessel to remain in a dangerous place until it is about to break up, when they purchase the cargo, etc., for a low price, and leaving the crew nothing but their lives, put them in a miserable hut and sell food to them at extortionate prices. There is another important point to be noticed. The banished persons in order to gain a livelihood pass themselves off as physicians, and frequently poison the people by giving them drugs of the nature of which they are ignorant. The islanders, too, are not ashamed to squeeze newly born children to death, and lives of both mother and child are often destroyed by attempts to procure abortion with mulberry leaves and another plant.

I have many other things to relate, but publish this in the meantime, as I think it important for the benefit of such persons as may be travelling to Hachijô.

Digitized by Google

Digitized by Google

THE CLIMATE OF JAPAN

BY

DR. J. J. REIN,

Professor of Geography at the University of Marburg, Germany.

Translated by E. SATOW.

—o—

No Asiatic country and people have in the last decade awakened and captivated in so high a degree as Japan and its inhabitants the attention of the cultured West. The interest thus taken in what was happening in Dai Nippon, the great country of the Sun's origin, as the Japanese is wont to call his home, was moreover perfectly justifiable and natural. A people, which had hitherto sufficed to itself and had confined its intercourse with foreigners to the narrowest possible limits, which for centuries had pursued its own course of culture, and thus attained to a high point of civilization in many directions, suddenly came forth, impelled by external influences and by internal discord, from its seclusion, abandoned many ancient prejudices and institutions to which it had been attached, in order to busy itself in acquiring western civilization with the ensuing advantages. Great interest was excited by these changes, which although accompanied, as may be easily understood, by many mistakes, and often incorrectly interpreted or too highly applauded, presented nevertheless a strikingly new and instructive phenomenon in the life of Asiatic nations.

Note.—The original may be found attached to the Latin invitations issued by Prof. Dohrn, out-going rector of the University of Marburg, Germany, for the investiture of his successor, 15 Oct., 1876. Typis academicis N. G. Elwerti.

Digitized by Google

It is not the object of this paper to discuss the results which have been been attained by this striving after civilization, much less to criticise the qualities and achievements of the army of over seven hundred foreign officials who entered the Japanese service, the obstacles which many capable and conscientious men among them met with in their efforts to be of use to the country, or any of the other topics which might suggest themselves. It is however certain that England and America obtained most influence in Japanese affairs, and that too for reasons which are not far to seek. The teachers who came to Nippon from these countries understood extremely well how to secure high salaries and to provide an easy vent for the inconsiderable stock of gold, which the country possessed. France, Holland and Germany supplied a more modest and far worthier contingent.

The educated German element in Japan received scientific coherence and manifold stimulus through the establishment of the German Asiatic Society, to which von Brandt (formerly German Minister Resident at Tôkiô, now Envoy at Peking) rendered great services. Many valuable contributions to our better knowledge of Japan are already to be found in the publications of this Society, and we can only hope that the same degree of interest and aptitude which its founder and earliest leader exhibited will be found amongst his successors.

The erroneous ideas concerning the natural resources of the Japanese Empire, started and nourished during centuries by the fabulous reports of Portuguese missionaries and Dutch merchants, united with the political and social changes already alluded to in producing feverish speculation in the import and export trade with Japan. The importance of the country to foreign commerce was over-estimated, and there assembled in the ports opened by Treaty to foreign intercourse, Yokohama, Hiôgo or Kôbé, Nagasaki, Tôkiô, Hakodate and Niigata* an extremely mixed society from nearly all countries of

* Arranged according to their relative importance.

Digitized by Google

the distant West, with the view of profiting by the advantages which were dreamt of, as well as by those which really presented themselves.

Since it has become possible to hasten across the North-American continent by train in a week, and to cross the Pacific from San Francisco to Yokohama in from 18 to 21 days, Japan is annually visited by another class of foreigners, whose members bring the dollar with them instead of coming in search of it, and many of whom are induced by scientific motives to spend a few weeks in Japan. But their "Trip round the world" is too hasty and too easy-going to allow of their accounts being founded upon thorough study or producing anything really new. The impressions which they carry away with them are almost always favourable, whether they come straight from the American Eldorado or have previously paid a short visit to the Chinese. In either case they are surprised by the cleanliness, and by the courteous friendly manner of the Japanese, but even more by the beautiful scenery, which is certainly capable of captivating in a high degree whoever is susceptible to it. We do not find here merely the ordinary charm which sea and well-watered mountain ranges impart to the landscape, but Japan possesses a luxuriance of forest and field vegetation and a wealth of various botanical forms such as no other extra-tropical region in the world can boast of. The labours of Kæmpfer, Thunberg, von Siebold, Bürger and others have long ago made us partially acquainted with this part of the natural history of the country, to say nothing of the services rendered by later investigators, such as Maximowitsch, Savatier, and so forth. No other country has helped to increase the number of our favourite ornamental plants in equal measure with Japan, and we meet the children of its Flora everywhere in our forcing-houses, gardens and public pleasure-grounds. The peculiarities of this Flora, the great number of its genera and species, their relationship to those of India, China and North-America, have been made in various quarters the object of learned and extremely interesting investigations, amongst

Digitized by Google

which those of Grisebach are of the most eminent importance.

These studies in botanical geography suffer however almost all from two essential defects: in the first place that most collectors in Japan obtained from Japanese and forwarded to Europe as indigenous species, a quantity of plants which had been introduced along with Buddhism and other forms of culture from China and partly even from India, and are never found growing wild, which is indubitably demonstrable of most ornamental and useful plants. Furthermore, the physical peculiarities of the country and especially the character of its mountain ranges were hitherto not sufficiently (or not at all) known, to be capable of being taken into consideration, seeing that all earlier collecting and observation was of necessity confined to the littoral region. Now it is certain that the botanical character of a country is by no means exclusively determined by the cosmical conditions which prevail at the present moment, but still, climate and the character of the soil, the orographical elevation of the latter being also taken into account, are always the most important factors upon which plant-life depends: Even the character and material condition of a people, the capacity for cultivation in this or that direction which its home possesses, the possibility of the transplantation to other regions of the earth of the products peculiar to it, and many other things, can only be correctly understood with the aid of accurate knowledge and a satisfactory appreciation of the climate and soil.

The climate of a country is proximately determined by the amount of warmth and moisture which it receives in the course of a year. Warmth and moisture are the most important factors in the development of vegetable life, and far more influential than the character of the soil. It is only where a copious annual precipitation is combined with a constantly high temperature, as in south-eastern Asia, the West Indies and Brazil, that we find the tropical luxuriance and abundance which have been so often extolled. All vegetation ceases below the freezing point,

Digitized by Google

and yet, even at the confines of perpetual snow, the soil, which, though only slightly warmed, is saturated with moisture, brings forth an abundance of arctic-alpine herbs and shrubs, whilst the tropically situated but rainless volcanic mountain ranges at the straits of Bab-el-mandeb are as naked as the sandy wastes on the coast of Peru.

A knowledge of the climatic conditions of Japan is not only of general scientific interest, but also, as must sufficiently appear from what has already been said, possesses a practical value. The object of this paper is partly to stimulate its advancement, partly to make some immediate and real contributions to it, to contest erroneous views of the subject, but more than all to lay the foundation of a better comprehension of the botanical phenomena in those distant islands. * It is based partly upon original observations made in the course of extensive journeys through the islands of Honshiu (Nippon), Amakusa, Kiushiu and Shikoku in the years 1874 and 1875, partly upon the records of various observers at the treaty-ports, which have been converted according to the metrical system and are brought together in tables in the form of an appendix.

These meteorological observations were taken partly from Jelinek and Hann's excellent *Zeitschrift für Meteorologie*, partly from other sources, and are of very unequal value. Many others could not be made use of at all, either owing to the untrustworthiness which they indicated of the instruments with which they were taken, or of the observers themselves. Tested instruments, even yet a desideratum in Europe, to say nothing of a country where members of different nationalities take observations: side by side the Englishman and the American in true conservative fashion with their inches and lines and Fahrenheit scale, the German with Paris lines and the degrees of Réaumur, the Frenchman and Italian

* The writer intends to work up as a supplement the geology and physiography of the country, as far as his observations permit of it, and thus to present as complete a picture as possible of the theatre of a History of Civilisation which in its strange-looking phenomena offers us much that is instructive.

Digitized by Google

again in some other way. The necessity of an uniform, or, we may as well say it at once, of the metrical scale for observations is nowhere more striking, except in editing a meteorological journal or in writing an article upon the climate of different countries, than in Japan.

Since the latest treaties* Nippon, or the Japanese Empire, stretches from 24° to 50° 40′ N., and from 124° to 156° 38′ east of Greenwich and embraces:

1.—The four large islands: Honshiu, *i.e.* the mainland, called Nippon by foreigners, Kiushiu, *i.e.* Nine-provinces, Shikoku, *i.e.* Four-provinces and Yezo [Hokkaidô].

2.—Chishima, *i.e.* the Thousand Islands or Kuriles, namely from Yezo to Cape Lopatka.

3.—Riu-kiu, the Loochoo islands.

4.—The islands of Sado and Oki in the Japanese Sea.

5.—Tsu-shima and Iki-shima in the Korean Strait.

6.—Hirado and Gotô (Five Islands), besides Amakusa and the Koshiki group on the west side of Kiushiu, as well as Tane-ga-shima, Yakuno-shima and other islands on the south.

7.—Awaji in the gulf of Ôsaka, part of the Japanese Inland Sea.

8.—The Shichitô, *i.e.*, seven islands south-east of the peninsula of Idzu, and lastly

9.—Munintô or Muninjima, *i.e.* the uninhabited islands, from which the appellation Bonin islands is derived, between 27° and 28° north latitude and on the 140° meridian east of Greenwich.

In consequence of this striking extension in length (more than 26° of latitude) the climatic conditions differ of course to an extraordinary degree in different parts of the country, so that while the Loochoo and Bonin islands, which lie close to the tropics, enjoy perpetual summer, the Kuriles share the arctic climate of Kamschatka.

It will be enough for our purposes, if we disregard these extremes, and confine ourselves to considering more closely the meteorological conditions of the four large islands.

* With China, 30 October 1874, with Russia 7 May 1875 and with Chôsen (Korea) 26 February 1876.

Digitized by Google

We are engaged then with a region which spreads from 31° to 45½° north latitude and from 129½° to 146° east longitude from Greenwich. The west coast is bathed by the Sea of Japan, the south and east coasts lie under the direct influence of the Pacific Ocean, whilst on the north the Sea of Okhotsk and the Gulf of Tartary send their cold waters to the coast of Yezo.

Japan is at present divided for administrative purposes into three capitals (Chin. *Fu*, Jap. *Miyako*) Tôkiô (Yedo), Kiôto and Ôsaka, and into sixty prefectures* or *Ken*, to which must be added the Loochoo islands, which form a separate government or *Han*. The earlier division into Circuits (*dô*), and of these again into provinces (*shiu*), subdivided into departments (*kôri*), being founded upon natural boundaries, harmonizes better with the objects we have in view, and is here added with the names of the chief towns, to serve as a guide.

(Here follows the list of provinces and towns mentioned in the text.) †

Any one who arrives in Japan for the first time during the winter, after having left the mild shore of California a few weeks before or perspired under the tropical showers of the littoral region of Malacca, is not a little surprised at the low temperature and cold northerly winds which prevail at that season. He had entertained other notions of the climate of a country where the camellia blossoms in winter in the open air, where the bamboo developes a stem 20 metres high and 45 centimetres in circumference, where a palm, too, is to be found and the sugar cane is cultivated. Whatever he may have heard of the great contradictions of the continental climate of China and Siberia will hardly have been attributed by him to the Japanese islands. When he takes their southerly situation into consideration, he is inclined to think of the Mediterranean region, where many a man seeks shelter from the northern winter, and where there

* The no. of prefectures is now 35. E.S.

† To be found, as far as the provinces are concerned, in my paper on the Geography of Japan in Vol. I. of the Society's Transactions. E. S.

Digitized by Google

are not a few places, even in the parts belonging to Europe, in which snow and ice are unknown. In fact, if the climate of Japan depended only on the strength of the insolation it would be scarcely possible to conceive how that of its capital Tôkiô could so diverge from that of the island of Malta, situated on the same parallel of latitude, or how it could be possible that Nagasaki should sometimes experience snow and ice, and possess an average temperature of 6.3° Centigrade in winter, whilst at Funchal in Madeira, situated only six minutes further south, the thermometer at the same period never sinks below 12°C. and stands on the average at from 15°-16° C.

All the mountain ranges of Japan are wrapped deep in snow throughout the winter; from many mountains it never disappears entirely, and even the slate ridges in the centre of the island of Shikoku, (which lies to the south and is bathed by the Kuroshiwo) of not more than 4,000 feet elevation, still showed white caps in April of last year. West of Yokohama and Tôkiô appears the majestic peak of Fuji-no-yama, like a huge fan turned upside down, which gleams red like the peach in the early morning, and pure white like a gigantic sugar loaf, when the sun climbs higher on a clear winter's day. In spite of the marked contrast which he presents to the pine-clad hills around him, yet the whole picture round us is wintry. The grass is brownish grey and looks drier than with us, the fruit-trees are leafless, and the puddles in the rice-fields, the play-ground of wild duck, geese and snipe, are often covered during the night by a crust of ice, which however does not resist the warm rays of the high mid-day sun. Snow falls at Tôkiô three or four times during the winter and covers the ground to a depth of 3 to 5 inches, seldom more, but does not lie long. Frosty days, *i.e.* days on which the thermometer does not rise above freezing point during the twenty-four hours, occur very seldom and only with a persistent north-west wind, but on the other hand, it often falls several degrees below zero at night for weeks together, and the nights already in

Digitized by Google

November even, and not rarely until April, present strikingly low temperatures. Frosty nights were observed in

	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Winter.
1871-72	8	21	26	17	9	1	82
1872-73	4	15	23	24	15	—	81
1873-74	7	18	24	16	3	1	69
1874-75	—	15	28	25	3	—	71
Average	4.75	17.25	25.25	20.5	7.5	0.5	75.75

Such minima of temperature follow almost without exception bright days with wind from the north or northwest, a high barometer and slight humidity of the atmosphere, or precede them. The greatest variation between the diurnal heat and nocturnal cold of a week often takes place within eighteen hours. All this harmonizes with observations which have been made elsewhere; it has been experimentally demonstrated by Tyndall and others and confirmed by figures, how the moisture of the lower strata of the air counteracts the nightly radiation of heat from the earth and prevents it from cooling down very much. Tôkiô and Yokohama, both situated on the Bay of Yedo a few miles apart, and surrounded by hills of insignificant height, agree closely in their climate. From the capital we have more than two years' meteorological observations of E. Knipping, which have been published in parts 1-7 of the Transactions of the German Society for Natural History and Ethnology of Eastern Asia, and observations for three years of the Imperial Mining Department at Tôkiô, for which I am indebted to Mr. G. Hochstetter, its chief. The German Legation, where I made observations during my stay in Tôkiô, is not far from both these stations, and I was able therefore to compare their results with my own, and to ascertain that the barometrical data of the Mining Department are too high, whilst the temperatures of Knipping, an otherwise very trustworthy observer, are too low, as is shown also by the results of the observations made at Yokohama. As concerns the latter, I might add to those of Doctors Mourier (1865) and Hepburn (1863—1869), which were quoted in Jelinek and Hann's *Zeitschrift für Meteorologie*, those

Digitized by Google

of Lieutenant Sandwith R.M. for the year 1874, which appeared first in the *Japan Weekly Mail.*

With regard to thermometrical conditions, the observations for Tôkiô and Yokohama which have been quoted, yield an average annual temperature of 14.3° Centigrade (acc. to Knipping 13.6°C., acc. to Sandwith 13°C.) In the winter the mercury falls on exceptional occasions to —8.8°C* (on the average—5 to—6.5°C) and rises in summer to 35.5°C so that the annual variation amounts to 44.3° C. But of these extremes the above-mentioned cold occurs scarcely once in five years, while the summer-heat attains its maximum of 35·5° only on one or two days in the course of July and August. Amongst places which have approximately the same latitude as Yokohama, Canea in Crete has 18° C. as its annual average, Gibraltar 17·3°C.; whilst the isotherm of Yokohama passes through Bologna (44°30′) and Marseilles (43°18′). The low temperature during the winter months is well worthy of notice. This amounts on the average according to Knipping to 3.6°, according to Hochstetter to 3.9°, according to Mourier to 5.7°, according to Sandwith to 2.9° and according to Hepburn 5.1°C., the average of which is 4°C. March and November also exhibit very low temperatures, 7° and 9° respectively. It has already been noticed that even in April the thermometer sometimes sinks as low as zero Centigrade and even lower. The average heat during the three summer months amounts to 24.1°, so that a difference of 20° prevails between the summer and winter temperatures; but between the hottest month, namely August with 26½°C. and January with 3°C. as the coldest, a difference of 23½° C. shows itself, as great as in Prague and Pesth. Analogously to these surprisingly great differences of temperature between winter and summer, the variations of the thermometer within a month, and even within a day, are found to be very great. The monthly variation

* On 13th January, 1876, the thermometer marked acc. to H. Joyner: "Imperial Meteorological Observatory, Tôkiô, Japan" actually—9.2° C.

Digitized by Google

is greatest in March, when it amounts to 26—31°, whilst the daily variations attain their maximum of 15—17° likewise in spring. Constantly hot weather begins only about the end of June, and terminates usually in the middle of September, sometimes in a sudden manner with a typhoon.

The climatic conditions of Niigata (37° 55′, 139° 10′ E. from Greenwich) possess especial interest, because this town lies close to the most northerly region, with successful tea-cultivation, on the left bank of the exit of the Shinano-gawa into the Sea of Japan, from which it is separated on the west by a row of sand dunes 18 metres high. The Shinano river waters a considerable plain lying north and south, which is shut off to the east by a lofty range of mountains, which forms the boundary between the province of Echigo on the one side, and those of Ugo, Iwashiro and Kôdzuke on the other, and possess peaks from 2,000 to 2,500 metres in height, which, like Iitoyosan (vulgo Iidesan) on the boundary of Echigo, Iwashiro and Ugo, between east and 80° southeast of Niigata, are already continuously covered with snow in the beginning of October. The littoral district (Hokurokudô) which lies on the Sea of Japan, is cut off by this range and its continuations from the Tôsandô and the rest of Japan, and possesses climatic peculiarities to which I have already† called attention, and to which I shall return in the sequel. The same range contains the Mikuni tôge, *i.e.* the Pass of the three provinces (Echigo, Kôdzuke and Shinano) which is about 1,300 metres high, and across which lies the shortest way from Niigata to Tôkiô. The two largest branches of this range form the watershed of the upper Shinano-gawa and its tributaries towards east and west, and at the same time are the boundaries of the loftily situated province of Shinano. The easterly and lower of these two chains of mountains contains the still active volcano Asama-yama, over 2,500 metres high, while on the western, which I have called the

† "Reise in Japan 1874" in Petermanns geogr. Mittheilungen 1875. Heft VI,

Digitized by Google

snow mountains of Japan, rises Ontaké or Mitaké, 3,000 metres high, the second highest mountain in Japan. ‡

Both ranges are well given in map No. 43c. of Stieler's hand atlas, but the south-westerly continuation along the blue boundary line of the Hokurokudô, south of the towns of Toyama and Kanazawa, where Shiroyama or Hakusan, (white mountain), almost perpetually covered with snow, is well worthy of notice, is less exact. West of Hakusan the range loses in height between Echizen on the one side, and Mino and Ômi on the other, but can be traced still further, forming the boundary between the Sanyôdô and the Sanindô, as far as Shimonoseki at the south-west point of the island.

Table III. contains a summary of the observations for temperature taken by the German Consul Leysner and the English Consul Enslie at Niigata during five years. It results from these, that Niigata possesses an average annual temperature of 13.11 ° C. and that this is consequently 1.2 ° C. lower than that of Tôkiô and Yokohama. In winter, the thermometer sinks sometimes as low as —9 ° C. and rises in summer to 35 ° — 36 °, *i.e.* as high as at Yokohama. The average summer temperature of 24° C. at Niigata differs only slightly from that of Tôkiô, whereas the mean of the three winter months, namely 1.95° C. is 2° lower. If we compare these thermometrical conditions at Niigata with those of some other better known places at the same latitude, we find the annual mean for San Francisco 15.9° C. for Athens 17.7° C. and for Palermo 19.5° C. respectively higher by 2.8° C. 4.6° C. and 6.4° C. At Niigata the mean temperature in January and August, the coldest and the hottest months, is 0.88° C. and 26.39 C.° respectively, whilst at San Francisco January shows 9.8° C. and Sepetember, the warmest month, only 14°. 6°C. So that a continental climate prevails almost at Niigata, a sea-climate on the other hand at San Francisco.

In judging of the thermometrical conditions of Hako-

‡ Fuji-no-yama, the highest, attains an altitude of 3729 metres.

Digitized by Google

date and of Yezo in general, we rely on the meteorological observations of Captain Blakiston, likewise of Dr. Albrecht and Kosteroff, which are printed in Jelinek and Hann's Journal; further, upon the reports of Captain St. John and others. The town of Hakodate lies in 41°.46′ N. and 140.° 45.5′ east of Greenwich on the Strait of Tsugaru on the south side of the island of Yezo. A hilly ridge, up which it partly climbs from the level shore, protects it against violent winds from the land side. The annual mean according to the first table is 8.6° C. according to the second 9.3° C. consequently 8.9° C. taking the mean of the two, so that the isotherm unites Hakodate with Berlin. The mean summer temperature amounts to 18.5° C. the winter mean being—1.3° C. The isotherm of 18.5° C. connects Hakodate with Munich and Moscow, the isocheim of—1.3° unites it with Raykiavig and Breslau. We observe further from the lists that the annual extremes are—16.7° and + 28.9° C. which give a total difference of 45.6° C. The amplitude between the coldest monthly mean and the warmest, *i.e.* of January and August with—2.6° C. and + 21.4° C., namely 24° C. is similar to that of Washington and Tiflis. During seven months of the year the thermometer sinks at times below freezing point. The change from winter to summer comes on at the end of May, and is rapid; the summers are short, but warm; the climate is much severer on the north and east coasts of the island of Yezo, which are exposed entirely to the influences of cold arctic currents, where the soil frozen two feet deep does not thaw before the end of May, and the snow completely disappears only under the influence of the high June sun, and where the effect of the insolation on the soil is constantly weakened during the short summer by fogs, and where no suitable locality can be found for cultivation.

For Ôsaka (34° 20′ N. 135° 10′ east of Greenwich) Table V presents us with observations, which extend over too short a space of time to allow of satisfactory conclusions being drawn from them, especially as regards the rainfall, which appears to denote an abnormal summer.

Digitized by Google

The town, which has often been compared with Venice on account of its numerous canals and bridges, lies at the mouth of the Yodo-gawa, which flows in a South-westerly direction out of the Biwa lake, and adds a considerable volume of water to the shallow bay between the island of Awaji and the mainland. The fertile plain through which this river flows in the lower part of its course, is bounded on the east by a range of mountains, which is continued across Awaji through Shikoku and Kiushiu, on the west by the range of heights which parts the Sanindô from the Sanyôdô, on the north in the province of Yamato by connecting members of both ranges, by mountain ridges which cut off the Biwa lake from the plain of Ôsaka and closely hem in the valley of the river. In this manner Ôsaka lies in a proportionately sheltered situation, which together with the difference in latitude, explains the somewhat higher temperatures as compared with Yokohama.

The town of Nagasaki lies in 32° 44′ N. and 129° 42′ East of Greenwich at the bottom of a small bay, which stretches up into the land from the South. Consequently, as well as owing to the mountain ridges which surround the town on all sides almost in its immediate neighbourhood, it lies in a very sheltered position, so that, as Krusenstern has remarked, the water in the harbour is seldom powerfully agitated. The shore is so shoal that at ebb-tide—(the difference of rise and fall amounts on the average to 2·26 metres)—broad tracts are left dry near the town. Table VI A. gives no absolute thermometric and barometric extremes, but only the monthly means of the weekly maxima and minima, a method which does not sufficiently disclose the great variations, and this is to be condemned from the point of view of geographical botany. In Table VI B. which represents Geerts' observations for one year, it strikes one as curious that the thermometer in 1872 only rose to 33.9° C., while it reached the height of 35° C. at Tôkiô. The isotherm of 17° C. connects Nagasaki with the Bermuda Islands and Gibraltar, which lie almost on the same parallel of latitude,

Digitized by Google

whilst its isocheim passes through Montpellier. The lowest winter temperatures at Bermuda and Nagasaki are respectively + 10 C.° and—4.9° C.

No meteorological observations from Southern Kiushiu are known to me, but I was assured at Kagoshima that winters without snowfall were the exceptions, and that the water in the washing basins not unfrequently freezes at night, but here the slight and airy structure of the houses must of course be taken into account. As is the case with the tea plantations in Uji-gôri, north of Ôsaka, so also in the district of Kokubu, a plain on the south-east of the bay of Kagoshima, I have convinced myself that the beds of young tobacco plants are protected at night by straw coverings during March and April, a proof that at this time of the year the temperature must approach pretty closely to freezing point, and that too in 31½° north latitude.

It is well known that the height of the barometer depends upon the insolation, the force and direction of the prevailing currents of air, and the amount of moisture contained in the atmosphere. Similarly with the variation of the daily and annual temperature we distinguish daily maxima and minima for the barometric height, as well as a period of the year with a maximum and another with a minimum atmospheric pressure. As the atmospheric pressure diminishes with the increase of the temperature, the barometric minimum would be reached on single days, and also in the course of the year, simultaneously with the maximum temperature, and *vice versâ*, a higher atmospheric pressure would correspond to a lower temperature, that is to say if the other factors of which it is a function were all zero. This is however by no means universally and always the case, owing to other influences. For example, whilst at Nagasaki, the strongest atmospheric pressure is observed in January and the weakest in August, coincident with the extremes of temperature, we see by the data for Hakodate, that the barometrical maximum occurs in March, the minimum in July, corresponding to the conditions on the coast of the

Digitized by Google

neighbouring continent. The data for Yokohama and Tôkiô are too various and contradictory to allow of general rules being inferred from them. At Hakodate the annual mean of the atmospheric pressure is 756.5 Mm, at Nagasaki 761.8 Mm, at the former place the means in March and July are 760.0 and 752.7, at the latter, those of January and August 766.4 and 755.6 Mm. respectively. We can see from this that a higher atmospheric pressure prevails on the whole at Nagasaki than at Hakodate, in entire conformity with the conditions which are known to exist elsewhere at these different latitudes.

Analogously to the striking variations of temperature already mentioned, the yearly oscillations of the atmospheric pressure are also very considerable. The barometer frequently rises to over 770 Mm., and sometimes even to 775 Mm., while it not infrequently falls below 750 Mm., to say nothing of its behaviour during violent gales. The barometer not infrequently exhibits the anomaly of rising with winds that bring rains and of preserving a great height for hours together during continued rains, only to fall after finer weather has supervened, along with a change of wind. On one occasion on the coast of Shikoku the barometer remained for a whole morning during persistent rain at 769 mm. I made the acquaintance in October 1874 at Kamaishi in Nambu (at 40° north latitude on the Pacific coast) of a striking example of the sudden changes of atmospheric pressure during a short time, without giving rise to a gale. On the 22nd October the barometer fell during a whole day during continuous rain to 747 Mm. at this place. A bright day followed with an atmospheric pressure of 772 Mm. Nevertheless persistent rain came on again during the following night, and the barometer fell again 20 Mm.

The character of the eastern Asiatic climate is in the first place, as far as wind and rain are concerned, determined by the prevalence of the monsoons. Cold northerly winds blow almost constantly during the winter. They are accompanied by increased barometric height, low temperature especially at night, when the sun does not counteract them,

Digitized by Google

generally a clear sky, and proportionately few showers of rain. Their prevailing direction is by no means the same on the different coasts, and the designation "North-east monsoon" is inapplicable to the coasts of Japan and their vicinity, with the exception of the southerly islands. During the winter months, a strong penetrating north-west wind blows almost without cessation at Wladiwostock and on the whole coast of the Asiatic Continent opposite to Japan. This is deflected in its progress across the Sea of Japan, and appears in Japan usually as a North or North-east wind. The latter sometimes lasts for a week, and as a rule is accompanied by fine weather. When it turns further to the East and South-east, rain is the consequence, but winds from this quarter are on the whole rare in winter. Duststorms such as often visit Peking in winter occur only rarely in Japan. I experienced one at Tôkiô on the 6th February, 1875. The thermometer had fallen during the night to—6.5° C. and did not rise in the course of the day over 4.5° C. while the weather-glass sank at 11 o'clock in the morning to 743.4 Mm. A strong cold wind blew from the north, the houses rocked under its gusts and the objects on the walls vibrated as during a violent earthquake. After a drought of several weeks, it whirled the light loose dust of the fields to a considerable height in the air, so that although the sky seemed to be cloudless not a trace of it was to be seen with the exception of a little spot round the sun. The latter seemed to have descended and to be floating in the sea of dust like a yellowish red ball; its rays were unable to reach the earth or to throw a shadow. The earth was as it were wrapped in a thick fog, only that the grey was mixed with the peculiar fiery yellow of the above mentioned particles of dust.

Southerly winds blow from the middle of May, and often even from April, until the end of August. On the Sea of Japan southwest winds (south-west monsoon) prevail, while in Yokohama and all parts of Japan adjacent to the Pacific Ocean, south winds predominate over

Digitized by Google

the southwesterly. The southwest monsoon, which sets in in April and prevails until the middle or end of September, brings a damp atmosphere and much rain to the coasts of eastern Asia. But the regularity with which the monsoons set in and blow on the Chinese coasts is unknown in Japan, as sufficiently appears from the tables. Great disturbances are easily understood and explained by its insular position and the influence which the Kuroshiwo exercises, leaving the deflection which the Japanese Mediterranean sea, as well as bays like those of Nagasaki and Yedo, produce within narrower limits upon lighter winds entirely out of the question. It is a matter of course that on calm days, land and seabreezes alternate in the usual manner on the coasts of Japan as elsewhere.

In table I, we find the number and direction of the winds for Tôkiô according to observations made during a period of two years. We get a better general view, if we take the 7 months from September to March, during which north and northeast winds prevail together and contrast them with the predominant southerly winds in the remaining 5 months.

	N.	N.E.	E.	S.E.	S.	S. W.	W.	N.W.	Total
Winter..	218	69	16	12	33	32	14	51	445
Summer.	22	36	38	38	115	94	11	7	361
1873-Year.	240	105	54	50	148	126	25	58	806
Winter..	205	97	25	13	33	29	8	28	438
Summer.	48	43	26	22	122	65	6	2	334
1874-Year.	253	140	51	35	155	94	14	30	772

If we take the means for the two years and turn them into decimals, we get

N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Total *per cent.*	
26,8	10,5	2,6	1,6	4,2	3,9	1,3	5,0	55,9	Winter.
4,4	5,0	4,1	3,8	15,0	10,1	1,1	0,6	44,1	Summer.
31,2	15,5	6,7	5,4	19,2	14,0	2,4	5,6	100	Year.

It follows from this that the force of North, North-east and North-west winds amounts to 52,3 per cent. of the

Digitized by Google

whole, whilst the South, South-west and South-east winds make up 38,6 per cent.

Table III. A. gives us a picture of the aerial currents which prevail at Hakodate. It will become clearer if we apply to it likewise the same process, and group the 7 colder months (September to March) together on one side, and the 5 warmer (April to August) on the other, and calculate the different winds, which are given here only for the four chief quarters, for them. We obtain thus the following scheme

	N.	E.	S.	W.
Winter.....	36,	26,4	24,9	89,9
Summer	7,5	50,0	38,7	30,1
Year.....	43,5	76,4	63,6	120,0

From this we see that North and West winds prevail in winter, South and East winds in summer. The assertion of Captain Scott* that strong winds blow continuously through the Tsugaru Strait, in winter from W.N.W. to E.S.E, and in summer *vice versâ* is in accordance with this result.

In speaking of winds in eastern Asia, it is necessary not to omit mention of the violent revolving storms called Typhoons,† which, closely related as they are to the West-Indian hurricanes and to the Cyclones of the Indian seas, are a terror to the navigator, and next to inundations the greatest terrestrial plague in Japan. With other circular storms, the Typhoons possess a common characteristic, namely the revolution round a centre, which advances constantly with more or less rapidity, and describes a parabolic curve, the storm-axis or storm-path, from southeast through south and west to northwest to northeast, but often too only from west to east. At the same time the tempest blows round the storm axis in a more or less cir-

* Japan Weekly Mail 8th December, 1875.

† The word typhoon is often derived from the Chinese *tai* great and *fu* or *fung*, wind. Others have indeed connected it with the Arabic word *tufan*, whilst we can hardly doubt its Greek origin, considering how Strabo, for instance, uses Typhōno-eides.

Digitized by Google

cular form from south to east, north, etc. in the northern, or *vice versâ* in the southern hemisphere, and that too with a speed and a barometric pressure which are at their minimum in the axis (where the speed is constantly almost zero, and the barometer sometimes sinks to 720-710 Mm.) and increase in proportion to the distance from it. The typhoons, like other revolving storms, do not blow constantly, but now and then in eviolnt gusts, and are accompanied at the same time by heavy showers of rain. This is so much the rule, that when in Japan persistent and violent rain comes on in August or September, without being preceded by a Typhoon, one is pretty certainly expected, since experience has taught that one or two of these storms occur every year in the latter part of the summer. It is very common too in August, when the heat is persistent, to hear the observation made that cooler weather cannot be expected before the occurrence of the typhoon. July, August and September are the months in which these revolving storms occur in Japan, and they seldom make their appearance as aerly as June or are delayed so late as October.*

The latter part of the summer of 1874 was especially marked by devastating typhoons. Table VIII. contains the meteorological observations made at Nagasaki during the course of one of these. It began during the night of the 20—21st. August, and committed great ravages throughout the province of Hizen. The barometer fell in the course of the day from 759 mm., at which it stood in the morning to the extent of 15.53 mm. by six o'clock in the evening; in the succeeding $6\frac{3}{4}$ hours it fell to 719.8 mm., that is, 39.18 mm. or 1.45 Paris inches in the course of 18 hours, and rose again in the following nine hours almost to its nomal heirght. It is also worthy of remark that the temperature was high at the outbreak of the typhoon, and still con-

* According to a comparison in H. Mohn's Grundzüge der Meteorologie, 46 Typhoons were observed in the China seas between 1780 and 1845; 2 in June, 5 in July, 5 in August, 18 in September, 10 in October, 6 in November.

Digitized by Google

tinued to rise somewhat, that heavy rain preceded it, accompanied its course and lasted during the three days following. The rainfall during the storm amounted to 57.912 mm., and on the following three days actually to the enormous quantity of 351.79 mm. making 409.702 mm., or more than 15 Paris inches, in all. For six days longer after the gale had ceased, the sky was heavily clouded and rain showers from the southwest were frequent.

The damage which this gale caused to the houses in the town, particularly on Deshima, amongst the ships in the harbour as well as in the fields, was great, and its traces could still be followed up in many places in the following year. It was unfortunately impossible to ascertain the extent of country over which the gale had spread, but I add the most important particulars which I was enabled to learn in addition.

The S.S. *Costa Rica* was on its way from Shanghai to Nagasaki, only 150 nautical miles distant, at the moment when the typhoon was raging in N.W. Kiushiu, without being affected by it in the slightest degree. At Yokohama, a moderate southerly breeze prevailed at the time of the typhoon and during the following day, the sky was slightly overclouded, the barometer stood at 756,2 mm. and had fallen but little during the two preceding days, the thermometer marked 28° C.

The state of things in the Japanese inland sea and its vicinity was different. Between Hiroshima in Aki and Onomichi in Bingo, about half way from Shimonoseki to Hiôgo, and at 33°20′ N. lat and 133° East of Greenwich, the gale commenced at 6.15 a.m. on August 21, from the north, veered round through east to south and southwest, reached its maximum development at 10·30 in the forenoon, and fell about 2 o'clock in the afternoon, when the wind blew with diminishing violence. About noon on the previous day a heavy shower of rain had begun, which had increased concurrently with the gale.

At Hiôgo, the barometer began to fall at 1.30 a.m. on the morning of August 21, at which moment a gentle breeze

Digitized by Google

was blowing from the N.E. At daylight the wind blew violently from the south. It increased in force and developed into a Typhoon, which attained its greatest height between 11 and 12 o'clock, after which it rapidly slackened and the wind changed to the west in the afternoon. From all this, it is to be inferred that Hiôgo was far removed from the axis of the Typhoon and in proportion only slightly affected by the storm.

At Yokohama a typhoon was felt on the 13th September in the same year, which attained its strongest development in Awa and Kadzusa, east of the Bay of Yedo. Its axis passed 25 nautical miles to the east of Yokohama, and described a peculiar path, which with other data has been published in the 6th part of the Transactions of the German Asiatic Society at Yokohama, according to observations made by Capt. Baron Reibnitz on board the *Arcona*. The storm began at Yokohama at 6 o'clock in the morning, with the barometer standing at 756 mm. at 21° C. with a North-east wind, had reached its greatest force about three o'clock in the afternoon, with an atmospheric pressure of 728.5 mm. and 24° C. The storm had in the meanwhile gone round by east to south and southwest, and blew finally from the northwest with diminishing force, the temperature being then 25,5° C. and the height of the barometer 749 mm. At Tôkiô the barometer stood at 727.5 mm. at noon. Rain had begun to fall early in the morning and with hardly a breath of wind stirring, then the storm set in and performed its revolution from northeast to northwest, developing its greatest force at southwest. The quantity of rain which fell on this day amounted to 80 mm. It is also worthy of remark that no essential change of temperature and in particular no fall of temperature took place during the course of either of these typhoons.

Brandes has pointed out the considerable disturbance of the atmospheric equilibrium which must follow upon a rapid condensation of the watery vapour contained in it, and uttered the opinion that the cause of storms was to

Digitized by Google

be sought for herein; and Prof. Ferrel in the American Coast Survey says: "The slight barometric depression which follows the condensation of watery vapour into water, forms the commencement of a current of air towards a centre, to which the circular movement of the aerial currents and the revolution of the earth impart further force and direction. Herein lie the beginning and the cause of a rotatory storm." And, finally, it is a fact that there are persons in every country, who in consequence of observations extending over a period of years, are enabled to predict the occurrence of a tempest or of a rotatory storm with considerable certainty from the formation of a cloud at a particular point.

Credit is due to Th. Reye for having, in his excellent work Die Wirbel-Stürme, Tornados und Wettersäulen (Rotatory Storms, Tornados, and Water Spouts) not only followed Brandes and others, in conceiving warmth which is disengaged by the condensation of atmospheric watery vapour as the moving force of rotatory storms, and mathematically proved its adequacy to explain the phenomenon, but also for having shown that all revolving winds, from the locally limited waterspouts to the circular storms which spread over a region of many square miles, owe their origin to the same cause. Reye has also shown that Dove's explanation of these storms, according to which they are chiefly referred to the invasion of the lower Trade-wind by the upper returning Trade-wind, does not correspond with the facts, and is untenable.

The behaviour of the typhoons in the Japanese seas and the accompanying phenomena harmonize throughout with Reye's views. If we reflect that they only occur during those months when the sea is rendered extremely warm by the powerful and lasting insolation, and the strata of air immediately above it are nearly saturated with moisture, we shall understand that whenever the slightest derangement of the thermometric conditions takes place in any part of this moist and hot stratum of air, a considerable formation of cloud will be initiated, and the heat disengaged at the same time must produce a current of

Digitized by Google

air from all sides towards this barometric minimum. A disturbance of the prevailing conditions of temperature, or to speak more clearly, a refrigeration of the sea-air saturated with watery vapour, does not, however, by any means always presuppose the appearance of a colder current of air (or perhaps of the opposite Trade); it may also be the result of contact with a colder marine current, as every observing navigator is aware. The belief, which we still find in all books treating of this subject, that typhoons accompany the change of the monsoon, and are to a certain extent dependent on it, must be designated as erroneous. As has already been mentioned, they do not begin before July, and the change of the monsoon in the earlier part of the year is free from them. Besides they are only exceptionally accompanied by thunderstorms, which as a general rule do not occur very frequently in the region subject to typhoons. On the other hand they are constantly ushered in by rain which begins while there is scarcely a breath of wind, and increases in violence concurrently with the wind and its shifting.

With respect to hydrometeors, the considerable rainfall on the occasion of typhoons, as well as the fall of snow at Tôkiô have been already mentioned, and it is only necessary to give the subject a short and general consideration.

ANNUAL RAINFALL AT

	HAKODATE.		NIIGATA.		YOKOHAMA.					
	Acc. to Blakiston & Albrecht 1860-70		1870-71		*a)* acc. to Hepburn 1863-69		*b)* acc. to Mourier 1865		*c)* acc to Sandwith 1874	
	Mean.		Mean.		Mean.					
	Quantity in mm.	Days	Quantity in mm.	Days	Quantity in mm.	Days	Quantity in mm.	Days	Quantity in mm.	Days
Rain...	1118,8	103,4	?	67	1794	97,4	1058,4	152	1878,9	121
Snow..		55,4	?	32		3				

Digitized by Google

ANNUAL RAINFALL AT

	TÔKIÔ.		OSAKA.		NAGASAKI.	
	acc. to Knipping 1873-74		acc. to Gratama 1870		acc. to Geerts. 1872	
	Mean.					
	Quantity in mm.	Days	Quantity in mm.	Days	Quantity in mm.	Days
Rain...	1694	139	1053,8	—	1211,6	122
Snow..						

From the foregoing synopsis of the very incomplete materials afforded by observation it follows that the quantity of the annual rainfall and the number of days on which it took place not only (from in part easily understood causes) vary very much at the different points of observation, but also at each place, with every year in which the observations were made, as appears from the results for Yokohama of Mourier with 1058,4 m.m. and Sandwith with 1878,9 m.m. The observations of Hepburn, carried on during many years, with an annual mean of 1794 m.m. or 66,5 Paris inches rainfall, to which Sandwith's observations approach, come in here very opportunoly. The large number of rainy days according to Mourier in proportion to the small quantity of rainfall, is indeed remarkable, and yet in no way deprives the data of credit. We must recollect that so-called dry and wet years occur in Japan as elsewhere, and if it has happened for instance that San Francisco with an annual rainfall of 21,69 Engl. inches, had only 11,73 inches in 1865, but in the following year on the other hand 34,04 inches, the foregoing data for Yokohama do not vary by any means so astonishingly. But one conclusion follows from the data of the annual rainfall at the Treaty ports of Japan, however much they vary among themselves, namely, that it is considerably and markedly greater than on the neighbouring continent. Still more significant than the quantity is the manner in which it is divided over the year. "The chief characteristic of

Digitized by Google

the Eastern-Asiatic climate," says Wojeikoff "is the prevalence of the monsoon. In winter the polar current prevails almost exclusively, with a clear sky, little rainfall, high barometer and low temperatures, especially in southerly latitudes. In summer the sea breeze penetrates far inland, causing heavy showers of rain, and the sky is for the most part clouded over. Over the whole of Europe and western Siberia the sky is more clouded in winter than in summer, but in eastern Asia, if we call an entirely cloudy sky 4, at Peking the most cloudy month=2,92 and the brightest December=1,21, at Nicolajewsk the cloudiest month August=2,33 the brightest February=1,34." The same author continues:—"The rainy season is late in the northern part of the monsoon region, although the sea breeze (summer monsoon), makes itself most decidedly conspicuous in July. The reason is to be sought in the fact that the seas north of 40° are real ice-basins, and get warm at a slow rate. But as soon as the sea once possesses a higher temperature than the land, the rain falls in torrents. The great difference of temperature between land and sea is also the reason why the rainfall is still considerable in Autumn and even in December." The conditions described here as characterizing the northeast of the Asiatic continent resemble those of Japan. No month passes without rain, but the quantity of rainfall during the warmer part of the year far exceeds that of the winter months. How entirely different, on the other hand, is the state of things on the opposite side of the Pacific Ocean, on the coast of the United States. It is true that there are no typhoons in summer nor other storms, which endanger navigation, but also there are no fertilizing rains, because the sea breezes come from the northwest, are heated in their passage over Oregon and California, and consequently retain their moisture.

If the difference of temperature during the winter between the mediterranean region and Japan announces an advantage on the side of the former, it is nevertheless counterbalanced with regard to vegetation, by the plentiful rainfall in Nippon, the amount of which

Digitized by Google

is not attained at any point of the shores of the Mediterranean, with the exception of the Ligurian coast and the region of the upper Adriatic, also near the Alps. In summer the hottest time in Japan, called *doyô*, from the middle of July to the middle or end of August, is the dryest. It is preceded by *Niûbai*, *i.e.* ripening of the plum, the most important period for the cultivation of rice, from the middle of June to the middle of July, in which rain is plentiful and often falls in torrents. Frequently it lasts for four or five days, and in 1875 it rained in the Iwate prefecture (Nambu) in N. latitude 40°, from the 2nd to the 10th July without intermission. All the rivers overflowed their banks, broke through the dykes, destroyed roads and footbridges, carried away houses and trees and converted smiling fields into uniform seas of slime. *Doyô* is followed by a second rainy season in the months of September and October, when the sea-breeze loaded with moisture secretes large quantities of water in consequence of the considerable nightly refrigeration of the land, and the change of monsoon at this time is also naturally accompanied, as in the spring, by plentiful showers of rain. The farther we go to the north, the later begin the summer rains and join on to the autumn rains.

Of the 1211,6 mm. of rain which fell at Nagasaki in the year 1874, 548.1 mm. and 286 mm. or 45.2 per cent and 23.6 per cent, belong respectively to the two periods, namely, from April to June and from August to September, so that 78,8 per cent of the rainfall for the year occurred during the 5 months April, May, June, August and September. January, October and November appear as the finest and most rain-less months, and July corresponds to the *Doyô* of the tracts of country which lie further towards the north. At Hakodate, July is the month of the greatest rainfall. To it belong 208,3 mm. or 18,6 per cent of the annual quantity of rain (or snow) whilst only 48,3 mm. or 4,3 per cent, fall to the share of January. At this place the four driest months, from January to April, get only 20 per cent of the total rainfall, so that the proportion of moisture between them

Digitized by Google

and the eight remaining months is as 1 to 2. At Yokokama according to Hepburn, January and September are opposed to each other as extremes, with reference to the quantity of rain which falls in each, with respectively 60 mm. and 259 mm., or 3,5 per cent and 14,8 per cent of the annual rainfall. The four winter months November to February get only 18 per cent, and to the remainder belong 82 per cent, so that the relative quantities of rain are as 9 to 20. There are few regions on the earth which resemble Japan with regard to the quantity and distribution of the annual rainfall. This is most the case in the Gulf States of North America, where the summer is also the rainiest time of the year, and the amount of rain resembles that of Japan. Mobile has a rainfall of 1625,6 mm., Baton Rouge 1528 mm., New Orleans 1295,4, St. Augustin 1092 mm.

Thunderstorms are neither common nor violent in Japan. At Yokohama from 4 to 10 occur annually, and all during the summer. The number is somewhat greater at Niigata, and is distributed chiefly over the latter part of summer. And the autumn fogs are equally rare, and occur even at Hakodate only about 6 times. The region of fogs begins on the east coast of Yezo, about the 42nd parallel of latitude, where the cold arctic currents in air and sea approach the warmer one of the Kuroshiwo.

It still remains to me in connection with the hydrometeors to speak more fully of the climatic peculiarities of the Hokurokudô, the region on the Sea of Japan, to which allusion has already been made. During the winter, deep snow envelopes the earth in the valleys of this region, while a gloomy veil of clouds covers the sky. I heard it often said in many places with reference to this, "It looks as if it would rain constantly," and fine days form the exception here. This is the case, especially in the provinces of Kaga, Noto and Etchiu, but Echigo also essentially shares this character. It takes you by surprise, when you leave Niigata in the beginning of December by way of the Mikuni-tôge, and after a long march through deep snow

Digitized by Google

reach the top of the pass at last. Then you look away across the wide plain towards Tôkiô, where summer still appears to prevail and a sky almost entirely free from clouds delights the eye, while a thick veil of clouds wraps the landscape in the direction of the sea of Japan. In the upper valley of the Tetorigawa, which comes from Hakusan and enters the sea below Kanazawa, the chief town of Kaga, at 700 or 800 metres above the sea, 18 to 20 feet of snow are the rule, and 5 to 6 feet the exception. In those parts the people inhabit the upper rooms of the houses, in order to enjoy the daylight, and buckle on rough snow shoes, in order to get from place to place at the cost of much trouble. Similar conditions are found in many other mountain valleys, whilst at considerably greater heights at the same latitude, but on the other side of the range, the snow is scarcely 1 foot to 1½ feet deep.

At Niigata, 32 days of snowfall are reckoned on the average. In January and February the snow covers the ground three or four feet deep, and the Shinanogawa freezes sometimes so that it can be crossed with cart and horse. During half the year, violent, cold north-west winds make the whole west coast of Japan unsuitable for navigation. Thunderstorms and hailstorms, five of which I experienced within a week towards the middle of November on the way from Akita to Niigata, usher in the winter in the flat country, and violent showers of snow follow soon after.

We easily obtain an explanation of this extraordinary snowfall and of the cloudy sky in the provinces of the Hokurokudô; we have only to recall to mind the manner in which the winter presents itself on the opposite side of the Sea of Japan. "If we except the winter of 1872-73, when abundance of snow fell, we may assume on the average to 15 to 20 days snowfall, otherwise a clear sky without clouds"; writes an authority* with respect to Wladiwostock, and the scanty reports which we have of the peninsula of Korea repeat a similar tale.

* E. Hansen in Jelinek and Hann's "Zeitschrift für Meteorologie" IX. 96.

Digitized by Google

When the cold, dry, north-west wind leaves the continent and blows across the sea of Japan, its temperature rises and it takes up at the same time considerable quantities of moisture, and that too not merely in a direct manner from the sea through contact with it, but also by mingling with the strata of air which it finds there. It then scours Japan, the temperature of which at this moment is considerably lower than that of the sea, and suffers in consequence, but especially by contact with the slopes of the mountain ranges, a considerable refrigeration. The result is the constant formation of clouds and the already mentioned abundant fall of snow. The hailstorms in November also point to a rapid fall of temperature and to low hanging clouds. When the winds finally cross the mountains, after the ensuing refrigeration and part with the greater part of their moisture, their temperature naturally increases again, the result of which is that the last clouds resolve themselves again into watery vapour.

The climate of Japan is without doubt influenced and governed to a great extent by the neighbouring ocean and its currents. In order to better comprehend this, we require before all things closer knowledge of this sea and of those parts with which we are here concerned. For the varied influence of temperature upon air and water is the fundamental cause of all meteorological phenomena on the earth. Owing to the high coefficient of expansion† possessed by the former, its climatic effects are more rapid and conspicuous than those of water. But the heating of the air and the solid earth by the sun would not suffice for the development of organic life, if water, which attains its maximum density at 4° C., did not expand considerably—in the proportion of 94 to 100—at the freezing point, by which means the formation of ice upon the surface of large masses of water is hindered. Whilst water in this matter forms an important exception to nearly all bodies, the specific gravity of which constantly

† $\frac{1}{215}$ of its volume for every degree, according to Regnault.

Digitized by Google

increases with the diminution of temperature until solidification takes place, it possesses the second, equally exceptional, quality of a high specific heat, which influences the climatic conditions even more perceptibly. The large bodies of water on the earth's surface absorb enormous quantities of heat from the air during summer and in warm regions, which they gradually give off again in winter and in cold regions, and in their conversion into watery vapour they take up incalculable quantities of heat which are again set free by the condensation of vapour into water, etc. In this way the sea especially acts as a storehouse in which the superfluous heat of summer and warm regions is garnered in order to meet the want of heat in the cold seasons and regions.

The striking example of this kind furnished by the Gulf Stream is well known. Just as it is a constant purveyor of heat to the west coast of Europe, so in the Pacific Ocean the same rôle is played by a similar current, the Kuroshiwo, with respect to Japan and the west coast of North America which manifests considerable analogy to the Gulf Stream in respect of its origin and course.

As soon as the northern end of the island of Formosa has been passed in going from Hongkong to Yokohama, a remarkable marine current is entered, which in summer flows thirty to forty miles daily (less in winter) in a north-easterly direction, and possesses a temperature higher by from three to four degrees than the contiguous sea. Under a cloudy sky its colour is grey, but deep dark blue when the sun shines, and it was this conspicuously dark colour which induced the Japanese seamen to give to this ocean current the name of Kuroshiwo, black stream. On the 19 December 1873, lat. 29° 24′ N. and 128° 18′ east of Greenwich its temperature was 23° C., and rose somewhat higher on the following day between the islands Suwoshima and Akiushima of the "Seven Sisters" and eastwards thence at the 130° meridian. In the latter part of summer, according to the records on board the P. & O. steamer *Avoca*, the water attains a temperature of 27° C., and is thus only 3° lower than the

Digitized by Google

highest temperature of the Gulf-stream. At the very same time (beginning of September) the navigator who leaves the port of Hakodate and steers south for Yokohama, finds that the temperature of the sea on the coast of Nambu (about 40° N.) rises within an hour from 20° to 25.5° C. and perceives by this as well as by other signs, that he has left the cold arctic current and has entered that of the Kuroshiwo.

In 1827 Captain Beechy obtained the following temperature on his voyage from the Munintô (Bonin islands) to Petropaulsk :

June 25 in lat. 38° 30′ N. Long. 154° 16′ E.—18,4° C.
„ 26 „ „ 40° 07′ N. „ 156° 53′ E.—11,4° C.

This makes a difference of 7° on passing out of the Japan Stream, as the Kuroshiwo is also called, into the cold northern current. Krusenstern and Cook also noticed the existence of this warm current during their voyages in the Pacific Ocean, but our more exact knowledge of its whole course dates only from the time of Perry's expedition, since which the Japanese seas, formerly so little known, have been traversed in all directions by men-of-war and merchant vessels.

As the Gulf Stream owes its existence to an equatorial current in the Atlantic Ocean and to the form of the North American coast, its direction to a reverse arctic current and more than all to the revolution of the earth upon its axis, so the origin of the Kuroshiwo is to be ascribed to the equatorial current of the Pacific Ocean and the peculiar coast formation of eastern Asia, inclusive of the Malay archipelago, and its course is to be referred to the revolution of the earth and a counter current from the north. Both warm currents commence near the tropic, remain somewhat remote from the coast of the neighbouring continent, soon take a northerly direction and only disappear on the coasts of another quarter of the globe, to which they are of the most sensible advantage.

The course of the Kuroshiwo is clearly given in Berghaus' map No. 9 in Stielers Handatlas. The stream begins between the Bashi-islands and Formosa, towards

Digitized by Google

the eastern side of which it turns to the north until about 26° near the (Loochoo) Riukiu group. A small branch continues hence in a northerly direction, passes along the west side of the island of Kiushiu through the strait of Korea and the Sea of Japan, and disappears finally in the cold waters of the sea of Okhotsk by La Peyrouse straits. But the principal volume of the warmer water proceeds further from Chusan in a north-easterly direction along the (Loochoo) Riukiu islands and then bathes the south-east coast of the three chief Japanese islands Kiushiu, Shikoku and Honshiu (Nippon). About the fortieth parallel of latitude the Kuroshiwo takes a more easterly direction, and curves at last south of the Aleutian islands, towards the coast of North America, which it brushes from the northwest, from Sitka to Cape St. Lucas under the name of the north Pacific drift, and to which it brings a very rainy winter mild out of all proportion. Only a small portion of the Kuroshiwo maintains east of the Nambu coast a northerly direction, and flows parallel with the Kuriles and Kamschatka, but at a slight distance from them, to Behring's Straits.

On the north-west side the transition into the Kuroshiwo is sudden and the increase of temperature in the air and sea very perceptible; in the case of the latter it sometimes amounts to nearly 10° C. The change on the south side is less striking, so that it is not easy to ascertain the boundary. We know that this current, like the gulf-stream, constantly increases in width, and that at 140° East of Greenwich it reaches from Cape King the south of the Bay of Yedo to the Bonin islands. At the edges of the Japan Stream, where it chafes against the cold counter-currents and the sluggish waters of the Ocean, as well as in its centre where islands and other inequalities of its bed produce whirls and eddies, a heavy swell and billowy sea prevail. Violent winds and showers of rain occur especially where the Kuroshiwo meets other currents, as on the coast of Nambu, where the cold arctic current from Yezo meets it, at Cape King and Cape Idzu where cold tides from the land strike against

Digitized by Google

it, and on the west coast of the island of Kiushiu, where it encounters considerably colder waters. When the south wind has prevailed for several days in summer in the Gulf of Finland, the sea water at the bathing place of Sweaborg is warm, while on the other hand that at Reval is cold. A persistent north wind causes the reverse, and carries the warm surface water to the south coast of the gulf. Just as the winds act here on a small scale, so have the monsoons a considerable influence upon the surface water in the eastern Asiatic seas upon a large scale.

On the south side of the little island of Enoshima, which has become well known for its silicious sponge (Hyalonema Sieboldi), not far from Yokohama, there is a cave, in which may be seen a small Buddhist temple, called Benten. This has to be removed from 12 to 15 paces further back at the commencement of the southwest monsoon, *i.e.*, every spring, because throughout the summer the wind dams up the water here as it does on all southern coasts of Japan, and drives it from 1 to 2 feet higher than it stands in winter. It is a matter of course that this influence extends also to the Kuroshiwo, the warm waters of which reach further to the north during the summer than during the contrary season of the year. According to Captain St. John the cold arctic stream ftom the northeast scours the east coast of Yezo throughout the year, and at the end of May possesses a temperature of only 2,8° C at the surface as well as deeper down. The west and southwest are exempt from this influence, get something of the warmth of the north-western branch of the Kurishiwo and possesses therefore a much milder climate. It proves true here also that in the economy of oceanic currents cold climates follow the polar waters towards the equator, while warm climates accompany equatorial currents towards the pole.

With regard to the portions of sea which lie west of the Japanese islands the slight depth of the Formosa channel, of the North China and Yellow Seas, and the mighty rivers which flow into them, render a great contrast

Digitized by Google

between the temperature of the sea in summer and winter readily comprehensible. In the end of August the temp rature of the water in the harbour of Shanghai rises to 31° C, but falls again gradually until it amounts only to 3,4° in January, and in the Formosa channel, where the seawater rises in summer to 25° C. it goes down here and there to 4,5° C. The Sea of Japan has not yet been satisfactorily examined, but as it possesses a more respectable depth and receives no large rivers, its temperature ought to be less subject to the influence of time of year, and that must just be of eminent importance to the climate of Japan, as it considerably mitigates the severe cold of the northwest wind in winter.

The Japanese Mediterranean between the islands of Kiushiu, Shikoku and the mainland is likewise not without climatic influence, at least upon its vicinity. It is connected with the Pacific Ocean by the Linschoten straits and the Bungo Channel, and with the Sea of Japan by the Strait of Shimonoseki. It abounds in islands, and is so shallow, that an elevation of eight meters would place the islands in connection with the mainland and with each other, as in fact they are connected from a geological point of view. Like harbours, shallow portions of the sea are much influenced by river water and by the seasons, and are colder in winter, warmer in summer, than the open sea. This is also seen in the case of the Japanese Inland Sea, the temperature of which falls in winter to 10° C., and rises in summer on the other hand to 25° C.

It follows from what has been said above concerning the climate of Japan, that it reflects the characters of that of the neighbouring continent and exhibits just like that two great annual contrasts, a hot damp summer and a cold, relatively dry, winter; that these two seasons lie under the sway of the monsoons, but that the neighbouring seas weaken the effect of these winds and mitigate their extremes, in such a manner that neither the summer heat nor the cold of winter attain the same height in Japan as in China at the same latitudes. Spring and autumn are extremely agreeable seasons, the oppressive

Digitized by Google

summer heat does not last long, and in winter the contrast between the nightly frosts and the midday heat produced by considerable insolation, but still more the raw northerly winds, cause frequent chills, though the prevailing bright sky makes this season of the year much more endurable than in many other regions where the winter cold is equal. As a fact, the climate of Japan agrees very well with most Europeans, so that people have already begun to look upon certain localities as climatic watering places, where the inhabitant of Hongkong and Shanghai can find refuge from the oppressive heat of summer and invigorate his health.

In most parts of Japan and for the majority of its plants the period of vegetation lasts six or seven months, namely from the beginning of April (middle of March) until the beginning or middle of October. The growth of all trees, even of the evergreens, is interrupted during the cold season, and shows distinct annual rings. Cycas revoluta, which is often found in gardens, does not blossom even in Kagoshima, and in Tôkiô has to be protected by a wrapper of straw against the cold winter nights. Lemons do not thrive in the neighbourhood of Tôkiô, and the beautiful oranges, which are here brought to market cheap and in large quantities ripen in the protected valleys of the province of Kii on the Linschotern straits opposite to theis land of Shikoku. The botanical geographer will recognize that under such circumstances the cultivation of the sugar-cane in the ordinary meaning of the expression is out of the question, and in fact where this plant is cultivated in Japan in limited quantities, as in Owari, Satsuma, Tosa and other southern provinces, scions are committed to the earth in the third month, and the canes are harvested in the ninth, or after a development which has only lasted half a year.

In September when the rice fields lose their green and the jays fly screaming among the trees, the forests begin to put on colour. Their autumn dress surpasses for beauty and variety of the tints the much lauded colours in which the North American woods glitter at this time. The

Digitized by Google

leaves of many species of the Rhus family, especially Rhus Toxicodendron L. and Rh. Silvestris S. and Z, many species of maple, relations of our cherry trees, oaks and wild vines furnish a variegated mixture of colours. At the end of October the deciduous trees are bare, and there are only a few plants left which have not entered on their winter's rest. These consist almost entirely of evergreens, which do not need a high temperature for the development of their flowers, which have already formed their buds during the warmer season, and in whose cases the powerful sunshine during the day seems not only to neutralize to a certain degree the effects of cold nights, but also to hasten inflorescence. To these belong Olea aquifolium S. and Z. and Aralia japonica which bloom in November, Thea sinensis Sims and Camellia sasanqua Thünb, whose period of flowering falls in November and December, and in whose case finally the nightly frosts destroy the last buds and before all Camellia Japonica L,. which in January and February sometimes affords the astonishing sight of blossoms and snow upon the same tree.

The condition of the vegetation in the first half of spring may be judged from the following notes of an excursion which I made on the 21st March 1875 from Kiôto to Kuramayama, a wooded district to the north of the old capital. I wrote at the time: "Animal life, like vegetation, is but little advanced, and insects are seen only rarely. The rape in the fields had already commenced to shoot up and a common weed, Cardamines sylvatica, had begun to flower. Besides this Prunus Mume S. and Z., Amygdalus Persica, L., Ilicium religiosum, L., Skimmia Japonica, Th., Eurya japonica Th., Parapyrola trichocarpa Mig. Chrysoplenium alternifolium L., Chr. flagelliforme Fr. Schm., Mercurialis leiocarpa S. and Z. Oxalis acetosella L., Bothryospermum tenellum, Mey., Corydalis aurea Wild. Clematis Williamsii As. Gr., Coptis quinquefolia Mig. Andromeda japonica Th., Camellia japonica L., Populus tremula L. and Petasites spurius Reich. were in blossom."

Digitized by Google

The predominant winter grains, barley, wheat and rape, which are sown in rows at the end of October, send up strong young leaves in November and the beginning of December, and cover the fields through the winter with beautiful green. But in the middle of December their development ceases, until the warm sun of spring entices them to renew their growth. On the Osaka plain the rape (Brassica Sinensis L.) shows its first blossoms in the beginning of April, but at Nagasaki it is 14 days earlier. There, as everywhere else in central Japan, it ripens, as does the barley also, in the beginning of June, while the wheat harvest takes place a fortnight later. How the low temperatures of the long winter keep the vegetation back, as compared with the countries bordering on the Mediterranean, is seen in the case of an east-Asiatic fruit-tree, Eriobotrya Japonica Lindl. which the English have transplanted to nearly all their subtropical and tropical colonies, and which ripens its fruit at Gibraltar in the middle of April, while it does not appear in the market at Ôsaka and Tôkiô until the beginning of June.

In the north of Japan the transition from winter to summer is sudden, as in all countries with the continental climate, in the south gradual. On the island of Amakusa as well as in the neighbouring Kiushiu most deciduous trees and shrubs were green in the second half of April, Rhus succedanea and Castanea vulgaris had half opened out their young leaves, and only Albizzia Julibrissin Boiv. still presented its winter aspect unaltered. I even found this low tree, called Mimosa arborea by Thunberg, a month later in the hill forests of the island of Shikoku, along with camphor trees and others of the laurel family, completely leafless, so that its Japanese name "*Nemu*, sleeper" suits it not simply on account of its sensitiveness and the sleepiness of its leaves.

In southern Japan there is another reason beside the gradual transition of the seasons into one another, which renders the beginning of summer less surprising. The deciduous trees of the woods and groves are too closely mixed with a large number of evergreens for their coming

Digitized by Google

into leave to be specially conspicuous. To which must be added that just about this time the evergreen trees and shrubs, inclusive of the bamboo, undergo a kind of moulting. Their old leaves have lost all their glossiness, fall off and give way to younger ones, which at first bright green, as in the case of the camphor tree, or whitish and reddish, as in the case of various evergreen oaks, gradually change to a deep, glossy dark green.

When the fields are sown with summer grains and the flute-like song of the *uguisu* or Japanese nightingale (Ficedula coronata) is heard from out the young foliage of the bushes, summer is already present, and the vegetation now begins to develope, under a powerful insolation, accompanied by plentiful and frequent showers of rain, a variety and fullness such as we seek in vain in the Mediterranean region. Japan owes these blessings to the southwest monsoon and to the Kuroshiwo, namely its fertilizing summer rains, its astonishingly rich flora and the possibility of reaping two harvests in the year off the same field.

Digitized by Google

Digitized by Google

ASIATIC SOCIETY OF JAPAN.

The Annual General Meeting was held at the Tôkiô Shôhei-kuwan on Saturday, 22nd June, Sir Harry Parkes, President, in the Chair.

The Minutes of the last meeting having been read and approved, the Secretary announced that Mr. Matsumoto Sôichirô, and the Hon. J. B. Phear, had been duly elected members.

The Library Committee announced the receipt of various new books and periodicals.

Mr. Satow presented a translation of a paper by Dr. Rein on the Climate of Japan, which on the motion of Dr. Murray, seconded by Dr. Veeder, was taken as read.

Mr. W. S. Chaplin then read a note on "Earthquakes in Japan." At its conclusion Mr. Dyer remarked that these researches had given an experimental proof of the non-existence of a relation between the times of most earthquakes and the position of the sun and moon. This might have been predicted by considering that the old theory of the constitution of the earth was now exploded, viz., that it consisted of a thin shell with a molten interior. According to the more modern theory of internal lakes of molten matter it was highly improbable that such a connection would be found to exist.

Dr. Murray agreed with Mr. Dyer in considering the existence of a connection between the frequency of earthquakes and the position of the sun or moon unlikely, and thought that the value of Mr. Chaplin's observations and calculations was very great. He knew the immense amount of time and trouble that the working out of such a problem had cost the author,

After some further discussion in which Dr. Veeder, Mr. Cawley, and Dr. Murray took part.

The President remarked that he attached much importance to the collection of such observations as were contained in Mr. Chaplin's papers. He had condensed much labour in small compass, the value of which would be appreciated by all those who were engaged in similar researches. The Society also, he felt assured, would express their estimate of it by an earnest vote of thanks.

Mr. Satow then read a paper by Mr. Dickins and himself on "Hachijô."

Digitized by Google

Mr. Grigsby said that they were very much indebted to the authors of the paper for such an interesting and valuable description of the island of Hachijô. He wished to ask Mr. Satow whether he had seen the account which had been translated by Mr. Longford and read before the Society. At that time it was the opinion of the members who heard the paper that the description was anything but accurate, and this opinion seemed to be borne out by the paper to which they had listened. He thought that Kæmpfer had been rather severely treated by the authors, and referred to several points in which the latter had corroborated Kæmpfer's account.

Mr. Satow in reply said that he had only read the translation made by Mr. Longford after the completion of the paper by Mr. Dickins and himself. The Japanese writer had made statements with regard to torture inflicted on the convicts, the truth of which Mr. Satow doubted, since none of the convicts with whom he had spoken had mentioned anything of the kind, but on the contrary represented their condition as comparatively comfortable. With regard to the remainder of the translation, it appeared to him that the statements of the Japanese writer conveyed a somewhat exaggerated picture of the condition of the inhabitants. With regard to the account given by Kæmpfer, it had not been the intention of Mr. Dickins and himself to attack the general accuracy of that author, who had been obliged to rely for information in many cases upon Japanese inhabitants of Nagasaki who could not be expected to know everything, especially of such a remote island as Hachijô. Mr. Satow adhered to the opinion expressed in the paper that Kæmpfer's description was extremely inaccurate, and quite opposed to fact in several particulars.

Dr. H. Faulds said that the paper appeared to be of remarkable value, and was full of suggestive points for discussion. The customs as to female seclusion at certain periods were not known by him to exist in Japan. It is remarkable that a discussion in Europe initiated by Dr. Matthews Duncan of Edinburgh should have led to practical conclusions in harmony with this apparently primitive custom, to a large extent. A very large mortality amongst women in childbirth seems to be due to a blood-poisoning called puerperal fever, which some think may arise from decomposing secretions. The mortality in some lying-in hospitals has risen to 1 in 13 cases of childbirth, and sometimes, a long succession of fatal cases has been traced to the same focus. The poorer women in large cities have been usually attended by medical students who are engaged in the dissecting or post-mortem room during the rest of the day; and it is supposed that contagious putrid matter may thus be the origin of disease, which spreads far and rapidly. It has been found safer to treat such patients in their own homes than in hospitals however well managed, and when admitted to hospitals isolation is now being carried out carefully and with a great diminution of the mortality. The question naturally arises, how was this custom organized

Digitized by Google

in Japan? Whether it may have been the result of simple experience accumulated during long generations, or has been acquired in some other way, when carried out wisely it would seem to be in pretty substantial harmony with the latest hygienic improvements.

The President concurred in the observation of Dr. Fauld that the paper was replete with valuable and suggestive information. It supplied an exhaustive description of an interesting island, which, although situated so close to the busiest centre of this country, appears to have been only imperfectly known to the Japanese themselves. The only accounts which foreigners had received of it were those of Kæmpfer, and Mr. Longford's translation of a recent Japanese description. Although Hachijô is so near to their shores the Japanese speak of having discovered it so late as 1487. We now know that it contains a considerable population, which possesses some very peculiar characteristics. The land, although not particularly fertile, is made so much of that it bears a high value, and their indigenous manufactures command a high price. The etymological interest attaching to their dialect and the preservation among them of the ancient custom of the seclusion and lustration of their women was exceedingly curious. This latter subject was one which he sincerely trusted would receive further attention from competent members of the Society, as an account of the ancient practices of Japan in respect to ceremonial purification would be very valuable, especially if it could be shown whether their origin was attributable to religious feeling, or to social or sanitary causes. The forms of lustration which the Japanese appear to have adopted bear a striking resemblance to those of the North American Indians. The description of the botany of the island apparently left nothing to be desired. He was surprised at the amount of information collected by Mr. Dickins and Mr. Satow in so short a time as a week, and he felt that in moving a cordial vote of thanks to them for such a valuable contribution to the Transactions of the Society he was only meeting the wishes of all the members.

Dr. Syle said that he would like to see the Japanese account of Hachijô printed as a supplement to Messrs. Dickin's and Satow's interesting paper, and he therefore proposed that it be so printed. Dr. Faulds seconded the motion, which after discussion, was put to the meeting and carried by 8 votes against 6.

The Report of the Council was then read by the Secretary. On the motion of Mr. Chaplin, seconded by Mr. Bramsen, the Report was adopted.

In acknowledging this approval of the Report and Accounts attached to it, the President observed that by far the largest proportion of the administrative work of the Society fell upon the Corresponding Secretary, the Recording Secretaries and the Treasurer. The Secretaries were constantly engaged in current business, while the great care which Mr. Ayrton had devoted

Digitized by Google

to his duties of Treasurer was well attested by the favorable condition of the finances of the Society. He was glad to think that the balance in hand would afford means for giving effect to the recommendation of the retiring Council relative to the publication of translations in future transactions. He considered he should also notice the labours of those members of the Society, who had worked with the retiring Council in the revision of the Rules, and that it would not be invidious to make particular mention of Mr. Grigsby's name, as he had given great attention to the subject.

The President next announced the names of the officers and members of Council elected for the ensuing yerr.

President.—Sir Harry S. Parkes, K.C.B.

Vice-Presidents.—David Murray, L.L.D., J. J. Keswick.

Councillors.—Tôkiô.—B. H. Chamberlain, W. S. Chaplin, E. Divers, M.D., D. B. McCartee, M.D., Rev. E. W. Syle, D.D. Yokohama.—F. V. Dickins, J. A. Geerts, J. C. Hepburn, M.D., T. Walsh, A. J. Wilkin.

Treasurer.—T. W. Hellyer.

Corresponding Secretary.—E. M. Satow.

Recording Secretaries.—W. G. Dixon, Tôkiyô, J. C. Hall, Yokohama.

Librarian.—H. Faulds, M.D.

Some of these gentlemen, including himself had, however, expressed their unwillingness to serve, and it was then decided that according to the Rules, their places should be filled by vote of the remaining officers and members of Council.

P.S.—The vacancies alluded to in the last paragraph have been filled af follows: Dr. Murray, President, Dr Syle, Vice-President, Mr. Mounsey and Mr. Dallas on the Council, in place of Dr. Syle and Mr. Wilkin. Dr. Faulds and Mr. Hall decline to act, and the post of Librarian and Recording Secretary in Yokohama are left vacant for the present.

Digitized by Google

CATALOGUE

OF THE

LIBRARY

OF THE

ASIATIC SOCIETY OF JAPAN.

ABEL.—China.
ADAMS.—History of Japan (2 vols.)
ADAMS.—Naturalist's Travels in Japan and Manchuria.
AMERICAN Geographical Society's Transactions, 1874 (2 vols.)
ASIATIC SOCIETY OF BENGAL.—Asiatic Researches (Vol. I to VI.)
ATKINSON.—Travels in the Regions of the Amoor.
BABA.—Japanese Grammar.
BALFOUR.—Waifs and Strays from the Far East.
BARROW.—Travels in China.
BEAUFORT.—Karamania.
BELKNAP.—Deep Sea Soundings in North Pacific.
BIGANDET.—Legend of Gaudama.
BLAKISTON.—Journey in Yezo.
BORGET.—La Chine et les Chinois.
BRITISH INDIA, Government of
BRADSHAW.—Guide to India, etc.
BRINE.—Taeping Rebellion.

Digitized by Google

BROWN.—Japanese Spoken Language.
BUNSEN.—Philosophy of Universal History.

CARPENTER.—Animal Physiology.
CORTAMBERT.—Cochin-China.
CHODZKO.—Specimens of the Popular Poetry of Persia.

DAVIES.—Microscopic Objects.
DAVIS.—Poetry of the Chinese.
DAVIS.—The Chinese (4 vols.)

DE CARNÉ.—Travels in Indo-China, etc.
DENNYS.—China Review (Vol. VIII.).
D'HERBELOT.—Bibliotheque Orientale (4 vols.).
DICEY.—A month in Russia.
DICKSON.—Japan.
DOVE.—Law of Storms.

EDKINS.—Religion in China.
EDUCATION DEPARTMENT.—Outline History of Japanese Education.
EITEL.—Lectures on Budhism.
ELPHINSTONE.—History of India (2 vols.).
EVELYN.—Diary (4 vols.).

FRANCHET AND SAVATIER.—Enumeratio Plantarum in Japonia (2 vols.).

GEERTZ.—Produit de la Nature.
GEOGRAPHICAL SOCIETY OF AMERICA.—Journal and Transaction, 1874 (2 vols.).
GERMAN ASIATIC SOCIETY.—Mittheilungen der Deutschen Gesellschaft (2 vols.)
GOLDSMITH.—History of Greece (2 vols.)
GRIFFIS.—Japan Pictorial Primer.
GRIFFIS.—Japan First Reader.
GRIFFIS.—Yokohama Guide.

HALL.—Loochoo.
HARDY.—Budhism.
HEPBURN.—Japanese and English Dictionary.
HUTCHINSON.—Buenos Ayres and Argentine Gleanings.

Digitized by Google

IDES.—From Moscow Overland to China.

JAPANESE EDUCATION.
JAPANESE ILLUSTRATED BOOKS.
JAPAN MAIL.
JOHNSTON.—Hand Atlas of Physical Geography.
JULIEN.—Le Livre des Recompenses, etc.
JULIEN.—Nouvelles Chinoises.

KINSE SHIRIAKU, from 1853 to 1869.
KLAPROTH.—Annales des Empereurs du Japon.
KLAPROTH.—Sanckokf Ason rau to sets (1 vol. and map).

LANMAN.—Japanese in America.
LEVINS.—Manipulus Vocabulorum.
LOCH.—Reminiscences.
LYMAN.—Yesso Geological Surveys.
LYMAN.—General Report of Geology of Yesso.

MACFARLANE.—Japan.
MACGOWAN.—Colloquial of Amoy (2 vols).
MACKINTOSH.—A Military Tour in European Turkey.
MACLAY.—Alphabetic Dictionary in Foochoo Dialect.
MALCOLM.—History of Persia (2 vols).
MARCO POLO.—Travels.
MICROSCOPICAL JOURNAL, October, 1873.
MILES.—History of Hydur Naik.
MILNE.—The Sacred Edict.
MORRIS.—Ayenbite of Inwyt.
MOUNSEY.—Caucasus and Persia.
MUELLER.—Fragmenta Phytographiæ.
MUNROE.—Geological Notes on Yezo.
MURGER.—Scenes de la Vie de Bohemè.
MURRAY.—Handbook to Greece, etc.

NAPP.—Argentine Republic.
NAVE.—Collection of Algae.
NEUMANN.—History of Pirates of China Sea.
NINAGAWA.—Art Ceramique.
NYE,—Morning of my Life in China.
NYE.—Peking.

Digitized by Google

OLIPHANT.—Lord Elgin's Mission to China and Japan.

PAGE.—Geology.
PAGÈS.—Histoire de la Religion Chrétienne au Japon.
PANTHIER.—Le Livre de Marco Pol.
PATON.—Servia.
PERRY AND AYRTON.—On Structures in an Earthquake Country.
PHILADELPHIA EXHIBITION.—Portuguese Catalogue.
PHILOLOGICAL SOCIETY'S VOLUME, 1862-1864.
PHILO SINENSIS.—Comparative Vocabulary of Chinese, Corean, and Japanese.
PHŒNIX (Vol. III.)
PIEROTTI.—Customs and Traditions of Palestine.
POPULAR SCIENCE REVIEW (Vol. V. to XI.)

RAFU.—Inscriptions Runiques du Slesvig.
RÉMUSAT.—Les Langues Tartars.
RITTER.—Erdkunde von Asien (13 vols.)
ROGERS AND MÜLLER.—Buddhaghosha's Parables.
ROSS.—Corean Primer.
ROYAL ASIATIC SOCIETY.—Journal (3 vols.)
ROYAL SOCIETY'S PROCEEDINGS.
RUSSIA IN ASIA (in Russian).

SANDWITH.—Trip into the Interior of Japan.
SATOW.—Japanese Chronological Tables.
SEMEDO.—History of China.
SHAKESPEAR.—Selections in Hindostani.
SHAW.—Tartary, Yarkand, and Kashgar.
SKEAT.—Maeso-Gothic Glossary.
SLEEMAN.—Rambles (Vol. I and II.)
SMITHSONIAN REPORT, 1875.
SMITHSONIAN REPORT, 1876.
SPENSER.—Faerie Queene.
STAUNTON, Sir G. T.—Memoirs of.
STEVENSON.—Translation of the Sanhita of the Sáma veda.
STOCQUELER.—Oriental Interpreter.

Digitized by Google

TALBOT.—Meteorological Observations, Yokohama, 1877.
TANDY.—Burmese Empire.
TAVERNIER.—Travels in the East.
THOMSON.—Bhagavadgátá.
TIMKOWSKI.—Travels.
TITSINGH.—Illustrations of Japan.
TOZER.—Highlands of Turkey (2 vols.)
TREVELYAN.—From Pesth to Brindisi.
TROLLOPE.—Australia and New Zealand (3 vols.)
U. S. A. SIGNAL SERVICE DAILY BULLETIN. (22 vols.)
VOYAGES OF THE MORRISON AND HIMMALEH, (2 vols.)
WALROND.—Letters and Journals of Lord Elgin.
WANKLYN AND CHAPMAN.—Water Analysis.
WATSON.—A History of Persia.
WESTROPP.—Archaeology.
WHITE.—Natural History of Selborne.
WHITNEY.—Oriental and Linguistic Studies.
WILLIAMS.—Observations of Comets from B.C. 611 to A.D. 1640.
WILLIAMS.—Chinese Empire (2 vols.)
WINTER.—Six Months in British Burmah.
WYSE.—Impressions of Greece.
YULE.—Travels of Marco Polo.

The Library also contains unbound copies of the following:—

AGRICULTURAL AND HORTICULTURAL SOCIETY OF INDIA.—Journal.
AMERICAN GEOGRAPHICAL SOCIETY.—Bulletin.
AMERICAN ORIENTAL SOCIETY.—Journal.

Digitized by Google

AMERICAN PHILOSOPHICAL SOCIETY.—Proceedings.

ASIATIC SOCIETY OF BENGAL.—Journal.

ASIATIC SOCIETY OF BENGAL.—Proceedings.

BOSTON SOCIETY OF NATURAL HISTORY.—Proceedings.

CELESTIAL EMPIRE.

CHINESE RECORDER.

CHINA REVIEW.

GUIDO CORA.—Cosmos.

JAPAN WEEKLY MAIL.

LA SOCIEDAD GEOGRÁFICA DE MADRID.—Boletin.

LA SOCIÉTÉ DE GEOGRAPHIE.—Bulletin.

LA SOCIÉTÉ DES ETUDES JAPONAISES.—Annaire.

MITTHEILUNGEN DER DEUTSCHEN GESELLSCHAFT.

OESTERREICHISCHE MONATSSCHAFT FÜR DEN ORIENT.

PHILOLOGICAL SOCIETY.—Transactions.

PHILOLOGICAL SOCIETY.—Extra Volume.

PORTLAND SOCIETY OF NATURAL HISTORY.—Journal.

ROYAL ASIATIC SOCIETY OF GREAT BRITIAN AND IRELAND.—Journal.

ROYAL ASIATIC SOCIETY, BOMBAY BRANCH.—Journal.

ROYAL ASIATIC SOCIETY, CEYLON BRANCH.—Journal.

ROYAL ASIATIC SOCIETY, NORTH CHINA BRANCH.—Journal.

ROYAL GEOGRAPHICAL SOCIETY.—Proceedings.

ROYAL SOCIETY.—Proceedings.

ROYAL SOCIETY OF TASMANIA.—Papers, &c.

SOCIÉTÉ D'ACCLIMATATION.—Bulletin Mensal.

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

3 2044 106 215 635

Digitized by Google